Framing mountains for environmental cooperation

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Comparing Regional Environmental Governance in East Asia and Europe (EE-REG)

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Editors
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Echenevex and Kyoto, August 2013
Jörg Balsiger and Aysun Uyar
Introduction: Comparing Regional Environmental Governance in East Asia and Europe

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Viewed from the perspective of regionalism (defined here as the political-ideological motivations underpinning institutionalized practices) and regionalization (defined here as the region-building processes that actors engage in) in their many disguises, East Asia and Europe are two of the world’s most dynamic regions. Consequently, scholars have long demonstrated a vivid interest in tracking, understanding, and explaining developments in the respective regions, often from a comparative perspective and mostly with a focus on economic integration and security cooperation (Balsiger and VanDeveer 2010, 2012).

Comparing environmental cooperation and governance in East Asia and Europe remains a much less visible subject, which raises the question whether findings in the study of one subject area have any purchase in another. For instance, some studies of regionalism in East Asia have suggested a gradual evolution from “projections of national models to the coexistence of several viable alternatives and the emergence of a truly hybrid form of regionalism” (Katzenstein 2006:2). Is this the case in environmental cooperation? If so, what are the sources and destinations of policy transfer, what instruments are being projected, and what is the impact on attempts to solve environmental problems? In Europe, the removal of barriers to trade, the creation of a single market, and the free movement of labor have been constitutive dimensions of regional integration, yet each of these policy domains has seen subregional variations such as in the case of the Schengen/Dublin agreements or monetary union. Can such variation be observed in environmental policy, and if yes, how are subregions defined, how do subregional policy instruments relate to global conventions, and what role does regional environmental policy making play beyond its borders? Above all, how do the nature and direction of trends in East Asian and European regional environmental governance (REG) compare, and what, if anything, can scholars and policy makers learn from the comparison?

To address many of these questions was among the core objectives of the workshop “Comparing regional environmental governance in East Asia and Europe (EE-REG),” organized by the Research Institute for Humanity and Nature (RIHN) and the University of Geneva’s Department of Geography and Environment (UNIGE) on 24-25 January 2013 in Kyoto, Japan. This collaborative initiative sought to produce a state-of-the-art assessment of recent developments in regional environmental governance in East Asia and Europe; explore similarities and differences in the nature and dynamics of REG in the two regions, especially with a view to refining an analytical framework for future comparative research; create a foundation for future collaborative research between scientists from Europe and East Asia, including through joint products emerging from the EE-REG workshop; and help raise awareness of the
importance of interdisciplinary research of regional environmental governance, particularly among East Asian research communities. This volume brings together the main contributions to the workshop, presents the main findings, and raises a number of questions for further research on regional environmental governance.

**Themes in Comparing Regional Environmental Governance**

Over the course of two days, regional environmental governance in East Asia and Europe was the subject of inspiring presentations and discussions by a group of experts from academia and the world of policy making, representing disciplines as diverse as political science, geography, sociology, law, hydrology, climatology, forest management, and glaciology. In order to maximize the potential for generating comparative insights, participants were identified with a view to fit a matrix consisting of three analytical themes (framing the region, crafting cooperation, reverberating beyond the region) and four topical themes (rivers and seas, mountains, extreme climate events and transboundary risk governance, air pollution and haze).

**Framing the Region**

Although much regional environmental governance emanates from established regional organizations, including regional economic integration organizations (REIOs) such as the EU or the Association of Southeast Asian Nations (ASEAN), the study of regional environmental governance must typically begin by addressing the question “What is a region?” Even where REG originates from REIOs, they can be in flux (e.g. EU expansion, ASEAN Plus Three). Where regions are defined on the basis of dense but non-institutionalized regional cooperation such as is the case of East Asia, the question what constitutes East Asia is important for environmental and other issues, since complementary, partially overlapping regional orders exist (e.g. Northeast Asia, Greater Asia, Panasia), or because some East Asian members are sometimes also considered part of other subregions (e.g. China as part of South Asia). Both regional flux through expansion and regional ambiguity through multiple affiliations can be observed in Europe and Asia. Differences in how they manifest become an important dimension in the comparison of European and East Asian REG.

A second reason why the question “What is a region?” is of particular significance in the analysis of regional environmental governance is that ecoregions such as river basins or mountain ranges are frequently assumed to be externally (scientifically) given, there to be discovered. Current work emphasizes instead that regions, including environmental ones, are socially constructed and that the processes of constructing them must be built into the analysis (Debarbieux 2012; Fall and Debarbieux, this volume). Whereas civil society and international institutions play an important role in this regard in Europe, the same is often seen as lacking in East Asia (Lee 2002). Furthermore, while ecoregions typically transcend (sub)national boundaries, the structure of regional political order in Europe and East Asia varies. Considering how these differences impact the ways in which regions for environmental governance come to be defined by various actors can reveal key similarities and differences between European and East Asian REG. In particular, it provides important insights into the role of science in regional environmental cooperation, which is one
of the main reasons to include natural scientists among the EE-REG participants.

Finally, comparing the framing of regions for environmental governance in Europe and Asia can be instructive through the lens of two special types of regions. First, there are typically multiple functional regions — a concept that refers to regions defined for a particular purpose such as river basins, coastal seas, airsheds, or animal migration corridors — which only partially overlap (Balsiger 2012). The scope of functional regions and overlaps, and in particular the ways in which these are recognized and mobilized by different actors provides important clues for how policy integration is organized in Europe and East Asia. Second, the crucial importance to Asia of shifting monsoon patterns raises the interesting question of how such a “mobile region” is framed, with what consequences, and whether an analog can be found in Europe, for instance in terms of transboundary risk management schemes for flood and other natural hazard events.

**Crafting Cooperation**

The second theme that will be used to focus the comparison between regional environmental governance in Europe and East Asia concerns modes of cooperation. On the surface, REG in Europe and East Asia are very different (Schreurs 2011; Koyano, this volume; Yoon, this volume), yet that difference is mitigated (a) when the scope of European REG is expanded between the narrow context of the EU to include other formal and informal initiatives (e.g. treaties under the United Nations Economic Commission for Europe, river commissions; see Ballaman, this volume), and (b) when the governance is interpreted broadly so as to encompass a wide variety of collective action shaping behavior (e.g. norm-promoting networks of cities or non-governmental organizations; see Kern, this volume), rather than more narrowly limited to legally binding regulatory norms. For instance, much East Asian environmental cooperation is carried out through development assistance (Mori 2005), which in Europe takes the form of EU cohesion programs in Eastern and Central Europe. Whereas Schreurs (2009) points to significant heterogeneity of economic development among states in the regions as a reason for the absence of regional cooperation, Li (2008) suggests similarities between the Baltic Sea area and Northeast Asia in terms of shared problems of their transnational pollution and the heterogeneity of the level of economic development of countries within each region.

Previous work on regional economic governance in Europe and East Asia has shown a marked tendency toward multilateralism in the former and bilateralism in the latter. An important question for EE-REG participants is therefore whether this contrast also applies to environmental governance, for instance in terms of coordinating mechanisms among overlapping environmental initiatives (Komori 2010). Or, since bilateral cooperation is also found in Europe and multilateral cooperation is also found in East Asia, under what circumstances one or the other prevails. Additionally, since a growing role of public-private partnerships and direct cooperation between subnational governments can be observed in both regions (Noguchi 2007; Odaira 2011), what can be said about these particular forms of cooperation?

A second issue that emerges from the literature on comparative regionalism is the role of cultural values. Much regionalist work on Asia has suggested an
“Asian way” in how cooperation is designed. Values principally derived from Confucian traditions are thus said to have contributed to particular forms of communitarian governance, an argument that is frequently advanced by Asian writers (Shin 2011). By contrast, Western writers analyzing forms of governance in Europe typically refer to legalist and individual rights-based cooperative traditions (witness the preamble of the rejected European constitution). In the context of regional governance, while Asian views of nature values are seen to have largely positive influences on society-environmental relations, critical environmental studies of the West arrive at opposite conclusions. Assessing whether and how cultural values indeed manifest in regional environmental governance, and with what consequences, emerges as an interesting, albeit tricky dimension of comparison.

Reverberating beyond the Region

The third theme concerns the embeddedness of European and East Asian regional environmental governance in larger contexts such as global regimes for climate change, transatlantic cooperation, or Asia-Pacific cooperation, as well as the links between Europe and East Asia. One dimension of this theme relates to policy mobility and diffusion, that is the degree to which ideas and practices travel from one region to the other (Stone 2004; Börzel et al. 2012; Solingen 2012). Subsidiary questions include the content and direction of what is mobile, the nature of agents of diffusion, and the dynamics and consequences of adoption and adaptation.

Finally, both Europe and East Asia (collectively or via constituent states or organizations) maintain neighborhood policies. In this special case, they meet in the Central Asian region, which emerges as a unique empirical field in which the encounter of European and East Asian regional governance can be studied.

Structure of the Volume

The three analytical themes outlined above appear in various ways throughout the contributions to this volume. In order to facilitate the discussions at the workshop, as well as add a second comparative dimension, four topical themes were defined as the organizing principles of the panels.

The first topical theme, rivers and seas, was presented by Kristine Kern on the governance of regional seas in Europe, with a special focus on the Baltic Sea from a comparative perspective; Takayuki Shiraiwa on the Amur-Okhotsk Consortium as an epistemic community concerned with the transboundary land-ocean ecosystem in Northeast Asia and the Russian Far East; and Makoto Taniguchi on knowledge sharing concerning transboundary surface and subsurface water management in Asia. The first two contributions are included in this volume.

The second topical theme, mountains, was addressed at the workshop by Simon Gaberell, who examined the framing of the Carpathian mountain range for regional environmental cooperation; Gilles Rudaz, who analyzed the place of mountains in regional cooperation in Central Asia; and Guofan Shao, Lina Tang, and Limin Dai, who addressed efforts to develop transboundary cooperation between China and North Korea along the Changbai mountain range. The first two contributions are included in this volume.

The third topical theme, extreme climate events and transboundary risk management brought together two presentations. Rolf Lidskog contributed a
reflection on the meaning of the notion “extreme event” and its implications for regional governance. Tetsuzo Yasunari presented insights on the positive and negative impacts of seasonal monsoon-caused precipitation, as well as societal means of adapting to the phenomenon. The first contribution is included in this volume.

Finally, a topical panel on air pollution and haze was constituted by two practitioners and an academic; all three contributions are included in this volume. Esook Yoon provided an overview of efforts to institutionalize regional environmental cooperation in Northeast Asia; Richard Ballaman offered insights and experiences from the UNECE Convention on Long-range Transboundary Air Pollution; and Sangmin Nam and Heejoo Lee examined atmospheric governance in Northeast Asia.

Four additional contributions round out the volume of proceedings. In addition to this introduction setting out the workshop context and themes, Juliet Fall and Bernard Debarbieux contributed a piece based on a keynote address on the question “How regional is regional environmental governance?” Mari Koyano reflected on the role of international law in discussions about REG in East Asia and Europe. And Aysun Uyar, Jörg Balsiger and Makoto Taniguchi presented a preliminary assessment of lessons learned from the workshop.

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Opening Note: Thinking about Regional Environmental Governance

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In 2004, the first Chinese taikonaut came back to earth. National and international media related that he had not been able to see the Great Wall of China with his naked eye while in orbit. He was obviously disappointed. Generations of schoolchildren, in China and beyond, had been taught that the Great Wall was the only human construction visible from space, or even from the moon. This space voyage had been presented as an opportunity for a Chinese person to confirm the story, though previous travels had already proved that the wall could not be seen from outer space. Yet, as many news outlets later reported, this idea that the Great Wall was visible from space was no more than a myth. But such mythical tales hold lasting appeal, even apparently appearing in Chinese school textbooks.

Sensing a public relations opportunity, the European Space Agency was quick to publish an image from its small Proba Earth observation satellite. This allegedly showed a remarkably clear image of the Great Wall, captured from 600 kilometres above the surface of the earth’s crust. The limitations of human eyes, or the human body itself, were apparently to be overcome with technology: nothing, this image appeared to suggest, was beyond the grasp of science. Political boundaries, even abandoned or historical heritage ones, were real material objects inscribed on the surface of the earth.

Source: European Space Agency
A few days later, the embarrassed agency had to retract the images, following the comments made by two scholars, respectively from California State University and Fudan University in Shanghai. The published image turned out to show only a river that fed into the Miyun Reservoir. The Wall, that great human creation, thought for so long to be so overpoweringly real as to be visible from outer space – despite being only a few meters wide – had turned out to be much less spectacular and more intangible than a simple river. Nevertheless, not to be undone, the European Space Agency indicated that although it was true that satellite imagery in natural light couldn’t show the Great Wall, radar imagery showing relief could. It quickly published a second photo to prove this.

This tale of the disappointed space traveller raises a similar question to that grounding the EE-REG workshop: what are the links between scientific expertise and the emergence of pertinent geographical objects? How can we think critically, and usefully, about how modern technology and contemporary political scenarios are interconnected? How can an awareness of these connections help us to truly think across and between disciplines, including between the natural and social sciences that often appear to share different standpoints about what constitutes a pertinent object of study? It is ironic that the tale of the taikonaut shows just how attached we continue to be to the idea that political divisions and natural features are somehow connected. Space travel was long associated with the idea of the Blue Planet: the sudden realisation that we all share a common destiny on a borderless and relatively small planet. Yet somehow we wanted to be able to see a real political boundary from space, even if this one has long ceased to demarcate the current borders of a state. We continue to look for “natural boundaries” in the most unlikely places (Debarbieux 2008; Fall 2010), looking to nature to reassure us that we are dividing up the world correctly, all the while abstractly understanding that we share a common destiny. The first REGov meeting, as well as our more recent discussions in Kyoto, went some way in exploring how this idea that natural features are connected to spatial political scenarios is historically charged. Back in June 2010, as well as in January 2013, a number of presentations suggested that creating efficient spaces of political interconnectedness grounded in the materiality of environmental connections requires understanding how such spaces are themselves constructed. We need to understand the new geographical objects that we are wrestling with. We need to explore these new territorial scenarios – what we are calling “regions” for the sake of argument (Debarbieux 2012) – and understand how they challenge yet rely on the continued existence of states, and particularly where neighbourly relations between countries are fraught.

If we agree that there are limitations and disadvantages in designing environmental governance solely on the scale of states, then what alternative forms of expert geographical knowledge should we draw on to rethink the spatiality of environmental governance? In other words, how do we make or construct these alternative and appropriate “regions” to help us design better territorial policies for regional environmental governance? Can such a process be reduced to a technological protocol of identifying appropriate scales

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1 See, for example
and rational and objective categories – strongly relying on knowledge from the natural sciences, for instance on hydrological basins, mountain ranges, or wind and ocean circulation – or should we realise that the very definition of these geographical objects as spaces of concern is in itself a fundamentally political choice?

That scientific expertise and technology has been called upon to validate, invalidate or even recast tales of divisions is nothing new. From the middle of the 18th century, Philippe Buache, together with his nephew Buache de la Neuville, argued that the role of scientific expertise was to reveal the concordance between physical geography and politics in order to bring about peaceful coexistence. In 1752, Buache presented a huge compiled essay in physical geography, accompanied by maps of France and the world, showing how the Earth was divided into hydrological basins and mountain ranges (Debarbieux 2008). He wrote that these natural divisions were invariable and would last to the end of time. Others subsequently drew on these divisions to suggest that were the boundaries of states to follow nature features, then contest and conflict would disappear, bringing lasting peace to the world. Physical geography was thus slowly invoked to determine the shape of political entities. Such arguments did not go unchallenged at a time of European conflict. To give just one example, in 1795 the Englishman William Eden published a damning put-down to such French claims, showing them to be nothing but hubris. He argued that “the French answer to these reasonings, that nature has pointed out the Alps, and the course of the Rhine and of the Lower Meuse, as the eastern and northern boundaries of the French Empire: if by nature is meant Providence (...) there is neither religion, nor sense, nor modesty, nor morality in such a pretension; it might with equal propriety be said, that nature has pointed out the Baltic and the borders of Siberia” (Eden 1795: 49). Politics were back out in the open, and the attempt to enrol topographical features to further political aspirations was identified for what it was: a political act, not simply a scientific process.

How scientific reasoning participates in creating geographical objects is now well-known, although that these principles of definition and delimitation lead to natural objects in whose concrete nature we end up believing continues to need restating (Schaffter, Fall, and Debarbieux 2009). In successive stages, an agenda emerged within the social sciences that explored the politicized construction of what came to be called “social nature” (for reviews see, for example Castree and Braun 2001; Bakker and Bridge 2006), drawing not only from social constructivism but also from sociological studies of science. In these lines of thinking, suggesting that nature contains unproblematic material boundaries is impossible and counterproductive: such divisions can only be thought of as constructions, as lines drawn politically, following particular explicit or implicit projects, even if they are literally grounded in material discontinuities.

However, this is far from the end of the story. For while there has to be space for understanding how natural regions, and how complex, diverse and non-congruent spaces for regional environmental governance are constructed – including as networks and complex topologies bringing together a wide variety of actors – we also simultaneously need to think about how we can make such spaces more useful and more effective for environmental governance.
References


RIVERS and SEAS
Governing Regional Seas in Europe: The Baltic Sea from a Comparative Perspective

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1. Introduction

Due to environmental problems, European integration, and various waves of European enlargement, the governing systems of Europe’s regional seas underwent rapid changes since the 1970s and are now shaped by a combination of national, international, European, and transnational governance. In recent years the EU has pursued new approaches that are more reliant on macro-regional strategies for balancing enlargement, external relations, and regional development. Initiatives like the “Northern Dimension”, which also includes countries neighbouring the EU, constituted a first step in this direction, and more recently this has led to the development of macro-regional strategies.

In the Baltic Sea region, the geopolitical landscape changed rapidly when Sweden and Finland joined the European Union in 1995, followed by Poland and the three Baltic Republics in 2004. Today, the Baltic Sea is virtually an internal sea of the European Union, with Russia as the only exception. The fall of the Berlin Wall triggered radical institutional changes since the early 1990s and strengthened the regional governing system in the Baltic Sea region considerably. Environmental governance in the Baltic Sea region has been transformed by EU enlargement but joining the EU had different implications for the countries in the region. For the Nordic countries it was essential to maintain their high environmental standards and, at the same time, gain more influence on environmental decision-making in Brussels. In Poland and the three Baltic States, EU accession triggered a new phase of environmental policy because the candidate countries had to adopt the acquis communautaire and adapt to EU standards before being allowed to enter the Union. In June 2009, the EU Commission presented the “EU Strategy for the Baltic Sea Region” as its first macro-regional strategy.

This article uses the Baltic Sea region as an example to examine the various elements that constitute multi-level governance in regional seas and asks as to how the regional governing system has changed over time due to EU enlargement. It discusses first how national, international, European, and transnational governance interact and contribute to the sustainable development of regional seas and then analyzes the limitations of regional governance systems. In the next section this article focuses on general aspects of the governing and governability of regional seas; and in the third section, the various elements of governing systems for regional seas are presented. The paper then turns to the main limitations of existing governing systems and asks as to how macro-regional strategies may help to meet the challenges and facilitate the prospects for the sustainable development of regional seas.

2. Governing and Governability of Regional Seas in Europe

From the perspective of interactive governance theory, governing a regional sea such as the Baltic Sea can be regarded
as a relationship between two systems, a “governing system” and a “system-to-be-governed”. Both systems are diverse, complex, dynamic, and vulnerable. While the former system is a social system made up of institutions and steering mechanisms, the latter system is partly natural and partly social because it consists of both the resources of the ecosystem and the stakeholders who may form political coalitions (Jentoft 2007: 360). Kooiman (2008) defines governability as a concept consisting of three main components, namely, a system-to-be-governed, a governance system, and the interactions between these two systems. Governance systems and the forms of interactions between the two systems differ, depending on the specific governance activities.

In the Baltic Sea region, the ecosystem (i.e. the system-to-be-governed) is a shallow and semi-enclosed sea and one of the largest brackish water bodies in the world. It is divided into several basins (such as the Gulf of Finland) and has a drainage basin four times larger than the sea itself, which includes non-coastal countries such as Belarus and Ukraine. The Baltic Sea ecosystem is unique and fragile, contains only a small number of species, and is highly sensitive to pollution. The pressure on the system is high because the sea harbours some of the busiest shipping lanes in the world and is surrounded by many large cities (such as St. Petersburg, Stockholm, and Riga) and regions with intensive industrial and agricultural activities. As water exchange between the Baltic Sea and the North Sea takes several decades, the concentration of toxic substances is much higher in the Baltic Sea than in open seas and oceans. The main risks to the Baltic Sea’s coastal and marine environment are (cf. HELCOM 2007):

- **Eutrophication**: Excessive nutrient inputs, originating from both diffuse sources (e.g. agriculture) and point sources (e.g. from sewage treatment plants), have disrupted the natural balance of the Baltic Sea. Symptoms include algal bloom and marine dead zones on the seabed.

- **Toxic substances**: Despite all efforts to reduce pollution, concentrations of hazardous substances (mainly from industrial activities) remain high in the Baltic Sea. Levels of dioxins in fish, for example, are above the EU safety levels for foodstuffs.

- **Biodiversity**: Natural characteristics limit the biodiversity of the Baltic Sea and make the ecosystem(s) exceptionally sensitive to pollution. The activities of commercial fisheries, offshore activities, and invasive species represent the most important threats.

- **Maritime activities**: With the growth in the economies of the countries around the Baltic Sea, traffic in the Baltic Sea has intensified. This increases the pressure on the marine environment and the risk of a potentially disastrous oil spill.

- **Over-exploitation of marine resources**: Degraded water quality and over-fishing has had an impact on the fish stocks in the Baltic Sea, and the recovery of depleted resources and damaged habitats requires cooperative actions.

Reducing these risks depends on the governing system of the Baltic Sea region. Since the Helsinki Convention was adopted in 1974 as the first regional sea convention worldwide, regional environmental cooperation started long before the EU enlargements in 1995 (Sweden, Finland) and in 2004 (Poland, Estonia, Lithuania, Latvia). However, the end of the Cold War had profound
repercussions on the governing system of the Baltic Sea region. Numerous new organizations were founded in this period, including intergovernmental organizations, such as the Council of Baltic Sea States, CBSS (1992), transnational NGOs, such as the Coalition Clean Baltic, CCB (1990), and transnational networks of subnational governments, such as the Union of the Baltic Cities, UBC (1991). Although such multi-functional organizations pursue a variety of goals, all of these organizations had environmental policy and sustainable development high on their political agenda from the outset. Apart from the emergence of new organizations, existing organizations were also transformed and adapted to the new situation. Thus, the Helsinki Convention gained four new signatories (Latvia, Lithuania, Estonia, and the European Community), while another signatory, the German Democratic Republic (GDR), disappeared from the map due to German reunification. These profound changes of the institutional landscape in the region included the introduction of new forms of public involvement and stakeholder participation. Such arrangements aim to utilize the specific knowledge of users and stakeholders, and are also essential for the legitimacy of decisions (Jentoft et al. 2007). Overall, it may be concluded that the EU integration triggered the transformation of regional governing system, which now involves a variety of public and private actors at different levels, and improved the preconditions for the shift in the Baltic Sea region towards sustainable development.

3. Elements of the Governing Systems of Europe’s Regional Seas

The governing systems of Europe’s regional seas are constituted by four elements:

• the environmental governance systems of the riparian states form the basis for the sustainable development of regional seas;

• forms of international and intergovernmental environmental governance have developed gradually since the 1970s in all regional seas in Europe;

• European governance is a newer phenomenon, which has gained momentum in recent years only, in particular through the various EU enlargements; and

• transnational governance can provide an additional basis for the development and implementation of innovative new forms of regional environmental governance.

The analysis of the regional governing systems and their capacities to improve the region’s prospects towards sustainable development needs to take all four components and their interactions into account.

National Environmental Governance Systems

National environmental governance may vary considerably among the states surrounding regional seas. Moreover, we find considerable differences among the various regional seas in Europe. While the North Sea is bordered by countries that all possess very well-developed national environmental governance systems, the group of Baltic Sea states includes both environmental pioneers and countries that started to develop their environmental policy only recently. Like the Baltic Sea, the Black Sea has been directly affected by the end of the Cold War, and many of the riparian states, including Russia, are in transition from socialist states to market
economies. However, in the Black Sea region only two countries (Bulgaria, Romania) are member states of the European Union. In the Black Sea and in the Mediterranean Sea the riparian countries seem to differ to a much greater degree than in the North Sea and in the Baltic Sea regions. Moreover, in these regions we find both interstate conflicts (for example between Georgia and Russia in the Black Sea region) and intrastate conflicts (such as the civil war in Libya). As national environmental governance systems are still the backbones of regional environmental governance, prospects for the sustainable development of Europe’s regional seas vary considerably and seem to be best for the North Sea and the Baltic Sea.

However, even in the Baltic Sea national environmental governance in the states surrounding the Baltic Sea varies considerably, due to the region comprising three Nordic countries, reunited Germany, and five former socialist countries (including Russia). While the Nordic countries and (West) Germany have gained well-deserved reputations as environmental pioneers since the 1970s, in the new EU member states and Russia, the development of modern environmental policy had to start from a background of centrally-planned economies, characterized by state-owned property, a one-party-system, and a lack of public debate on social and political issues (for the Baltic states, see Kontio and Kuitto 2008; Joas et al. 2008).

Although policies may gradually converge, individual attitudes are slow to change. Hermanson (2008), for example, finds that while the value shift towards more post-materialist attitudes that can be found in advanced industrial societies is only visible to a certain extent in the Baltic Sea region. In the Nordic countries and (West) Germany, environmental issues appeared on the political agenda as far back as the 1970s and social movements started to influence decision-making, first at the local level and eventually at the national level. In Poland, the Baltic States, and Russia the political institutionalization of environmental concerns started much later due to the political-institutional differences. Although environmental movements played an important role in some CEE countries, the region is still divided into two distinct clusters of countries with regard to environmental/post-material values.

Moreover, the analysis of the relationship between economic and environmental performance reveals essential differences between the political systems within the region. The relationship between economic growth and environmental pollution differs between the Nordic countries and Germany, on the one hand, and the former socialist states, on the other. In the latter group of countries, the decoupling of economic growth and environmental pollution occurred at a much earlier stage of economic development (Jahn and Kuitto 2008).

The development of political institutions shows a similar pattern. While in the Nordic countries and Germany environmental governance and environmental awareness evolved gradually and incrementally over several decades, the time-frame for such changes is considerably shorter in the new EU member states. EU influence during the accession phase became an essential driving force for the shift towards modern environmental governing systems in the former socialist countries (Kontio and Kuitto 2008). This means that EU integration has facilitated the convergence of environmental governance and environmental performance of the
countries surrounding the Baltic Sea, although marked differences remain and will persist for many years to come.

Although the EU and intergovernmental organizations such as the OECD have facilitated the spread of new forms of environmental governance, traditional forms of environmental governance, such as the Swedish ban on phosphates in detergents, still play an important role at nation-state level and dominate many areas of environmental policy. However, such hierarchical policy instruments may cause compliance problems and implementation deficits. If conservation goals can only be fulfilled by restricting the existing and well-established activities of citizens, who do not share these goals or the perception that their activities influence the pursuit of these goals, serious problems may arise and new forms of governance may be required to solve the underlying conflicts. Stakeholder involvement may help in the attainment of a higher degree of legitimacy and understanding for environmental regulation and create innovations designed to cope with the governance of complex, multi-level issues (cf. Varjopuro and Kettunen 2008).

**International Environmental Governance Systems**

Regional seas are affected by global agreements (such as the IMO convention and UNCLOS), for example in the area of shipping (Suárez de Vivero and Rodríguez Mateos 2002), and by international treaties for regional seas. Initial efforts to improve the environmental situation in regional seas started relatively early. The Helsinki Convention on the protection of the marine environment of the Baltic Sea area was already signed in 1974. It was the first regional seas convention and triggered the creation of UNEP’s Regional Seas Programme. Today this program covers 18 regions in the world, including the Baltic Sea (Helsinki Convention), the Mediterranean Sea (Barcelona Convention, 1976), the North-East Atlantic (OSPAR Convention, 1992), and the Black Sea (Bucharest Convention, 1992) (Costa 2009; Hoballah 2006; Doussis 2006).

HELCOM’s main goal is to protect the marine environment of the Baltic Sea from all sources of pollution and to restore and safeguard its ecological balance. In 1974, the then-seven Baltic coastal states signed a convention for the abatement of all sources of pollution around the Baltic Sea. The ratification process ended in 1980 and the convention came into force in May of that year. Following the collapse of the Soviet Union, the reunification of Germany, and the gaining of independence by the three Baltic States, the convention was revised, updated (in relation to the list of harmful substances), and broadened in scope (e.g. now also encompassing inland waters, coastal zone management, and biodiversity). The new convention was signed by all of the nine states that border the Baltic Sea and by the European Community in 1992 and entered into force in January 2000. In order to reduce land-based pollution, measures were extended to the whole drainage area of the Baltic Sea (Fitzmaurice 1992; Bruch 1999; Hassler 2004; Kern and Löffelsend 2004).

The HELCOM Baltic Sea Action Plan (BSAP) (HELCOMs 2007) was adopted in 2007 and now sets the framework for action. Its ambitious target is to restore a good ecological status to the Baltic marine environment by 2021. The plan incorporates the latest scientific knowledge and innovative management approaches into its strategic policy implementation, and stimulates close goal-oriented multilateral cooperation.
around the Baltic Sea region. The plan aims to resolve the existing problems, for example the eutrophication and deterioration in the water quality of the Baltic Sea. The action plan mentions four priority areas (eutrophication, hazardous substances, biodiversity and nature conservation, and maritime activities). It also presents specific objectives, such as reduction targets for nitrogen and phosphorus. In addition, the plan contains provisions for assessment tools and methodologies, awareness raising and capacity building, funding, and the implementation and review of the plan (HELCOM 2007).

This action plan is remarkable for several reasons: first, it is based on an ecosystem approach, i.e. the usual sectoral pollution reduction approach was replaced by a cross-sectoral approach that starts from the vision of a healthy sea with a good ecological status. The need for further reductions in pollution loads can be derived and the scope of human activities determined from this vision. Second, the plan emphasizes a broader view of sustainable development and thus combines ecological sustainability and a healthy environment with aspects of sustainable socio-economic development. Third, the plan is the result of the active participation of all major stakeholder groups in the region, i.e. the shared vision of a healthy Baltic Sea has been defined together with all relevant stakeholders. This decision-making procedure was chosen to ensure that the plan is truly relevant and can be implemented effectively. Fourth, the BSAP starts from a multi-level approach and thus distinguishes between measures that can be implemented at national level, at EU level (e.g. Common Fisheries Policy, Common Agricultural Policy), and at international level (e.g. shipping control by the International Maritime Organization).

**European Environmental Governance Systems**

The Europeanization of regional seas has developed very quickly. This is most prominent in the area of fisheries, which is dominated by the EU’s Common Fisheries Policy (Princen 2010), but includes a proliferating body of EU legislation affecting various aspects of the marine environment such as the Water Framework Directive, REACH, Natura 2000, and the EU Recommendations for Integrated Coastal Zone Management.

Moreover, the EU adopted a Marine Strategy Framework Directive in 2008 and is developing an Integrated Maritime Policy (see for example the Communication on Maritime Spatial Planning published in December 2010; COM(2010)771; De Santo 2011; Borja et al. 2010; Juda 2010; Koivurova 2010; Wakefield 2010; Fritz 2010; Queffelec et al. 2009; Suarez de Vivero 2006). The aim of the Marine Strategy Framework Directive is to protect the marine environment across Europe, to achieve a good environmental status of the EU’s marine waters by 2021, and to protect the resources on which marine-related economic and social activities depend. The directive constitutes the environmental component of the Union’s future maritime policy, which is designed to enable the fulfilment of the economic potential of oceans and seas in harmony with the marine environment. The Marine Strategy Framework Directive establishes marine regions on the basis of geographical and environmental criteria and requires that member states in all regional seas bordered by the EU ensure cooperation with all countries within a marine region and develop national strategies for their marine waters. These strategies must contain a detailed assessment of the state of the environment, a definition of “good
environmental status” at regional level, and the establishment of clear environmental targets and monitoring programs.

Instead of a sectoral approach, the EU developed an integrated approach for the protection of its marine environment based on the Ecosystem Approach to Management. However, both the governance systems (actors, institutional design, policy-science interfaces, etc.) and the “system-to-be-governed” may differ across Europe’s regional seas. Despite common objectives, the Europeanization of Europe’s regional seas may, therefore, lead to differing outputs. Moreover, trends towards regionalization and stakeholder participation can be observed in various areas, ranging from setting-up Regional Advisory Councils (RACs) for fisheries (Long 2010; Stör and Chabay 2010; Griffin 2007; Griffin 2009) to launching macro-regional strategies (EU Strategy for the Baltic Sea Region 2009; European Union Strategy for the Danube Region 2010).

In the Baltic Sea region, EU enlargement had an impressive impact on national environmental governance and triggered crucial changes in the regional governing system. The influence of the Nordic countries on the European Union was strengthened with the enlargement of 1995 when Sweden and Finland joined the Union. The EU enlargement of 2004 was probably even more important for the region because, with this wave of enlargement, the Baltic Sea became (almost) an internal sea of the European Union. Today, only the Russian Oblast Leningrad with the metropolitan city of St. Petersburg and the Russian exclave Kaliningrad remain outside the EU.

The Europeanization of the region has arisen due to both economic and political factors. Europeanization can be regarded as co-evolution between the domestic and European level (Radaelli 2006: 59) because it combines top-down and bottom-up approaches. However, enlargement can be described as a top-down process as it puts candidate countries under extreme pressure. The EU strongly influenced Poland, Latvia, Lithuania, and Estonia in the pre-accession phase. Although financial instruments also played an important role here, these countries were not allowed to join the Union before complying with the acquis communautaire, i.e. the entire body of EU legislation. This process of “governance by conditionality” (Schimmelfennig and Sedelmeier 2004) led to a relatively high degree of compliance in the area of environmental policy (Andonova 2005; Joas et al. 2008).

Soon after Finland and Sweden joined the European Union, the Finnish government initiated the “Northern Dimension” as a regional EU strategy which established a partnership between the EU, Norway, Iceland, and Russia. This shows that the activities of the EU in the region have both an internal dimension (concerning the member states) and an external dimension (concerning the neighbouring countries). In 2006, the Northern Dimension was transformed into a common regional policy. The new Northern Dimension has four geographical priorities (the Baltic Sea, Kaliningrad, the Barents Sea, and the Arctic). The program has a rather broad scope, placing a strong emphasis on environmental issues. This initiative includes the Northern Dimension Environmental Partnership (NDEP), which was established in 2001 by various international financial institutions.

More recently the EU started a new initiative, which aims to develop an “EU Strategy for the Baltic Sea Region”. The
Strategy was published by the European Commission in June 2009, the first steps towards its implementation have been taken already, and a report to the Council is due in June 2011 (European Union 2010). The Strategy concentrates on four goals to make the Baltic Sea region: (i) an environmentally sustainable place; (ii) a prosperous place; (iii) an accessible and attractive place; and (iv) a safe and secure place. The first general stakeholder forum took place in Tallinn (Estonia) in fall 2010, which focused, among many other issues, on the question as to how the Baltic Sea region could be made into an environmentally sustainable place. There is wide agreement that the EU Strategy for the Baltic Sea Region should facilitate the implementation of HELCOM’s Baltic Sea Action Plan. This is remarkable because the EU has also acknowledged that HELCOM’s Baltic Sea Action Plan could become instrumental to the successful implementation of the Marine Strategy Framework Directive.

**Transnational Environmental Governance Systems**

Transnational governance is also important for the development of regional seas. In all regional seas in Europe governmental initiatives have been supplemented by initiatives of non-governmental and subnational organizations (Joas et. al. 2008; Kern and Löffelsend 2004). Such forms of transnational governance range from the Black Sea NGO Network (BSNN) to the UBC. Transnational city networks have developed and thrived in Europe since the early 1990s (Kern and Bulkeley 2009). In recent years, the transnationalization of regional seas transformed traditional international organizations such as HELCOM, and even led to the establishment of new institutions such as Baltic 21 that practiced stakeholder participation from the outset.

Apart from Europeanization the most striking characteristic of the Baltic Sea region is its high degree of transnationalization (Kern et al. 2008), which has provided a fertile ground for other forms of transborder cooperation in the region. After the end of the Cold War, the Baltic Sea region developed into a highly dynamic area of cross-border cooperation and transnational networking. Numerous new organizations, that are often based on hybrid arrangements (including governmental, subnational, and non-governmental actors) (Joas et al. 2007: 241), have focused their initiatives on environmental policy and sustainable development initiatives.

Transnational links have always existed in the Baltic Sea region. These links have certainly contributed to the development of initiatives, which aim to promote the sustainable development of the Baltic Sea region, including both subnational governments (regions, local authorities) and civil society actors. Three different forms of transnationalization exist in the Baltic Sea region. First, traditional international and intergovernmental organizations such as HELCOM have been transformed in recent years. As the development of HELCOM’s Baltic Sea Action Plan shows, access to decision-making has improved for non-governmental and subnational actors. Second, new types of organizations have been established which aim to introduce non-governmental and subnational actors into the policy-making process. An outstanding example is Baltic 21 which was based from the outset on a multi-stakeholder approach and the active participation of civil society. Third, transnational networks, such as the CCB
and the UBC, have worked intensively on sustainability and environmental issues.

The regional cooperation of subnational governments can be traced back to the Hanseatic League. The cooperation between Hanseatic League cities, and in particular the twinning relationships between these cities, survived even the Cold War period. The UBC, a transnational city network with more than 100 member cities around the Baltic Sea, developed relatively spontaneously soon after the fall of the Berlin Wall (Groth 2001; UBC 2008). The main goals of city networks such as the UBC are: (i) best practice transfer and learning among their members; and (ii) representation and lobbying. City networks run projects which establish direct links between their member cities and facilitate both transboundary policy transfer and the joint development of innovative solutions. The UBC’s Agenda 21 Action Program certainly helped to spread Local Agenda 21 (LA21) processes in the region. Transnational networks are also created to bypass nation-states and to establish direct links between such networks and EU institutions (Kern and Bulkeley 2009). The cooperation between subnational governments in the region appears to be a rather unique feature of the Baltic Sea area (Kern et al. 2008).

4. Challenges Ahead

The different elements of the regional governing system and the complex interaction between national, international, European, and transnational governance may lead to three problems that will be discussed in the following section in more detail: (i) boundary problems, and the need for (ii) horizontal and (iii) vertical coordination.

Boundary Problems

Governing regional seas requires the establishment of a governance system for the entire region. Problems may occur because the boundaries of existing governance systems and the “systems-to-be-governed” are not identical. Thus, the scope of regional conventions may be more appropriate than EU legislation because these regional institutions focus on the entire region, including non-member states (such as Russia). Decisions made in Brussels need to be adjusted to regional environmental institutions (see, for example Backer et al. 2010 on the relationship between the Baltic Sea Action Plan and the EU Marine Strategy Framework Directive). The development of macro-regional strategies by the European Commission (Baltic Sea region, Alpine region, Adriatic region) points to a more regionalized version of European integration, which may strengthen regional governance systems.

In the Baltic Sea region, boundary problems are most evident in relation to the drainage basin of the Baltic Sea which is four times larger than the sea itself. Although countries such as Belarus have observer status in several regional environmental institutions, the inclusion of such states in the governing structure poses considerable problems. Even if they attend important meetings, they do not have any obligations to comply with the decisions made by the signatories of an international treaty or by the EU institutions for its member states.

European integration has changed the geopolitical situation in the region fundamentally and has facilitated simultaneously the emergence of a more appropriate governing system. Serious problems remain even though the Baltic Sea is almost entirely surrounded by EU
member states. St. Petersburg is the biggest metropolitan city in the region, and the situation of the Russian enclave of Kaliningrad, a product of WWII and the breakup of the Soviet Union, poses serious problems for the development of a strong governing system. Governing the Baltic Sea region depends, therefore, not only on decisions made by regional institutions, but also on both EU-Russia relations and Russia’s bilateral relations with individual EU member states. The recent debate on energy security and its repercussions for the Baltic Sea region, in particular the debate on the Nord Stream pipeline project, shows clearly that the positions of individual member states differ considerably.

Moreover, decisions made in Brussels may not always fully consider the situation in the region and, therefore, need to be adjusted to regional conditions. Contrary to the EU policies targeting all member states, the scope of HELCOM and Baltic 21 appears to be more appropriate in this respect because these regional environmental institutions focus on the entire region, including Russia. However, the development of the EU Strategy for the Baltic Sea Region may strengthen the regional governing system in the Baltic Sea region and facilitate the development towards sustainable development.

Need for Horizontal Interaction and Coordination

The existing governing systems in Europe’s regional seas are characterized by horizontal interaction (Gehring and Oberthür 2008; Young 2002). The need for horizontal coordination concerns, first, the EU legislation itself because different directives may lead to contradictory and incompatible policies. Second, increasing Europeanization of regional seas may cause coordination problems because the implementation of EU policies, such as the Integrated Maritime Policy and the new macro-regional strategies, requires close cooperation with already existing environmental organizations (such as HELCOM). However, institutional overlap between EU legislation and international conventions may also lead to synergies because international conventions and guidelines, which are not binding, can be translated into binding EU legislation.

In the Baltic Sea region, the lack of horizontal interaction and coordination is most evident in the case of HELCOM and Baltic 21 because both organizations focus on similar issues. However, Baltic 21 appears to be broader in focus than HELCOM because Baltic 21 was spurred by the Rio Conference and aims to support the region’s shift towards sustainable development. In contrast, due to its origin and establishment at a time when sustainable development did not yet feature on the political agenda, the original focus of the Helsinki Convention was primarily concentrated on environmental issues. The development of the Baltic Sea Action Plan, however, reflects a new trend towards the convergence of both approaches. HELCOM has now broadened its scope and chosen a perspective which is based on the idea of sustainable development. Moreover, the Baltic Sea Action Plan is the result of intensive stakeholder participation processes. HELCOM and Baltic 21 coexisted, and competed, for a number of years, but more recently HELCOM has become dominant, while Baltic 21 has been weakened considerably.

Problems related to a lack of horizontal coordination may also result from the increasing Europeanization of the Baltic Sea region because all of the riparian states (except Russia) are now directly influenced by decisions made in Brussels.
Thus, the implementation of the European Union’s agricultural and fisheries policies, the implementation of the Marine Strategy Framework Directive, and the development of the EU Strategy for the Baltic Sea Region require close coordination with the approaches chosen by HELCOM, in particular the implementation of its Baltic Sea Action Plan. The dynamic development of a variety of new organizations in the Baltic Sea region may lead to institutional overlaps and serious problems if several organizations focus on the same issue and do not coordinate their approaches.

Need for Vertical Interaction and Coordination

A lack of vertical interaction and coordination may also have negative effects on the regional governance system. The multi-level systems of regional seas cannot be governed solely by hierarchical structures. Alongside horizontal interaction between regional environmental institutions, vertical interaction is of special interest for the improvement of the regional governance system. The vertical integration of the (regional) multi-level system may result in a shift of competencies, for example upwards from national governments to the European Union and downwards to regions and cities (Rosamond 2010; Rosenau 2003; Pierre and Peters 2000: 77). Cross-level institutional arrangements such as transnational city networks may function as boundary or bridging organizations and play an intermediary role between different arenas and levels. This may also improve the performance of the regional governance system.

The debate on multi-level governance has shown that top-down and bottom-up perspectives need to be integrated if we want to govern a dynamic multi-level system like the Baltic Sea region. An example is the development of LA21 processes which emerged from the Rio Conference and led to initiatives in many countries around the Baltic Sea (Joas 2008), i.e. the global Agenda 21 initiative stimulated local innovations and experiments in many places around the Baltic Sea. Moreover, Baltic Sea cities such as Stockholm have not only established their own offices in Brussels and striven to influence European politics, they are also members of transnational networks such as the UBC, which has become an active player at both regional and European level. Evidence can be found for the successful integration of subnational governments in the implementation of the Helsinki Convention. Cross-level institutional arrangements such as the UBC can be seen as boundary or bridging organizations (Cash et al. 2006: 8) because they play an intermediary role between different arenas and levels.

5. Conclusions

Although various links exist between national, international, European, and transnational governance arrangements, research has focused primarily on specific environmental institutions (such as HELCOM), thereby neglecting the analysis of regional seas as multi-level systems. Governing regional seas requires a combination of national governance with forms of governance beyond the nation-state.

Despite the fact that national governments have become more and more involved in, and dependent on international and European policy-making, national governance has remained the backbone of regional governing systems. Governance for sustainable development in regional seas undoubtedly requires a combination of national governance with
forms of governance beyond the nation-state. Bilateral relations between the countries in regional sea areas need to be taken into account because they constitute an important part of regional governing systems.

Cooperation at international level fosters convergence, but differences remain, in particular when countries start from very different positions as, for example, Sweden and Poland. International and intergovernmental environmental governance started first in the Baltic Sea region. Since its establishment, the Helsinki Convention passed through different development stages. Most striking in this respect is the increasing inclusion of stakeholders in decision-making. Shortcomings remain, however, as clearly demonstrated by the ongoing discussion on the integration of HELCOM’s Baltic Sea Action Plan and the EU Strategy for the Baltic Sea Region.

Problems related to horizontal and vertical interaction point to the changing role of the EU, which has become the most important political player in Europe’s regional sea areas. The Europeanization of regional seas has gradually increased over time and this process will most likely continue in the future. The EU has chosen a combination of internal and external policies for governing regional seas. While the EU’s internal policies concentrate on its member states, its external policies focus on neighbouring countries and, in particular, Russia. The tension between Europeanization and regionalization has led to the development of new regional institutions, including macro-regional strategies such as the EU Strategy for the Baltic Sea Region. These strategies may not only help to resolve boundary problems, but may also provide tools for managing the horizontal and vertical coordination and interactions.

In addition, transnational governance is an important factor of regional governing systems. An active civil society and transnationally-oriented cities and regions can help to complement traditional forms of governance. The important role of transnational governance is a rather unique feature of the Baltic Sea region because similar arrangements cannot be found in other comparable regions. In the Baltic Sea region we find both an active civil society and cross-nationally-oriented cities and regions, which can help to complement traditional forms of governance. Recent initiatives such as the development of the Baltic Sea Action Plan and the EU Strategy for the Baltic Sea Region, which have both relied on various forms of multi-stakeholder participation, show that these assets can be utilized to improve the legitimacy of such plans and strategies and may even support their implementation. Such an approach may also help to solve problems that relate to the need for stronger vertical coordination. Existing institutional arrangements, such as transnational networks of subnational governments, Euroregions, and EU-funded projects (e.g. Interreg projects) could be utilized even better to strengthen the regional governing system.

It may be concluded, therefore, that the progression of Europe’s regional seas towards sustainable development depends on widening the scope of existing environmental programs and strengthening the regional governing system, which needs to become more integrated, both horizontally and vertically. The increasing Europeanization of regional seas requires that the EU, first, balances and integrates its own policies and, second, coordinates them with other regional (environmental) institutions, such as the Helsinki Convention and its Baltic Sea Action Plan. Moreover, the EU will
have to focus its initiatives even more intensively on subnational governments. Even though most EU legislation and essential provisions of international agreements are eventually implemented at local and regional level, the latter’s role in the sustainable development of regional seas has long been neglected.

References


Amur-Okhotsk Consortium as an Epistemic Community to Conserve the Transboundary Land-Ocean Ecosystem in Northeast Asia and the Russian Far East

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1. Introduction

Being situated at the northern end of the Japanese Archipelago, the Sea of Okhotsk provides the richest marine products together with its eastern counterpart, the Oyashio open water. The products are essential not only in the Japanese market but also in countries of the East Asia and the Russian Federation. The Amur-Okhotsk Project, conducted by the Research Institute of Humanity and Nature in Kyoto, Japan, clarified that the rich primary production both in the Sea of Okhotsk and Oyashio region depends on dissolved iron that was transported to the ocean from the Amur River (Heilongjiang in Chinese) (Shiraiwa 2011, 2012).

The river and ocean linkage found in the Amur-Okhotsk system is as follows: The highest concentration of iron was found dissolved in the wetlands of the Amur River Basin. It is clearly exemplified in Sanjiang Plain in China, where one of the most extensive wetlands is developed between the three rivers, namely, the Heilongjiang (Amur), Songhua Jiang and Ussuri Rivers. The dissolved iron is composed of humic substances produced in forests and wetlands and transported by the river system to the Sea of Okhotsk. The dissolved iron is then flocculated in the estuary area and precipitated in the continental shelf. Thermohaline circulation due to the formation of sea ice in the Sea of Okhotsk then transports the dissolved iron offshore with the help of the East Sakhalin Current until it upwells at the Kuril Islands. This is how the primary production in the Sea of Okhotsk and Oyashio open water utilizes the dissolved iron from the Amur River (Nishioka and Nakatsuka 2012).

In addition to nitrate, phosphate and silicate, the dissolved iron is essential for the photosynthesis of phytoplankton. The reason why the Sea of Okhotsk and the Oyashio open water can be characterized by the rich primary production in the world is most likely due to the input of dissolved iron from the Amur River. It is, therefore, reasonable to call the Amur-Okhotsk land-ocean linkage a “giant fish-breeding forest” based on a traditional Japanese concept named “fish-breeding forest (Uotsukirin 魚附林)” indicating that productive estuary areas are due mainly to healthy neighboring forests (Shiraiwa 2011).

The Amur River system transports pollutants, however. An explosive accident that happened in November 2005 at a petrochemical company in Jilin Province of China released significant amounts of benzene and nitrobenzene to the Songhua River and then to the Amur River (UNEP 2006). People living in the Amur River Basin became aware that point-source pollution of this kind could seriously effect both the ecosystems in the basin as well as the ocean down-river. It also raised the question of how we can control such significant transboundary environmental problem without the existence of multilateral treaties and cooperation.
In general, the estuary area is the most fertile region in the sea. But the area is also that most likely to be affected by inputs from adjacent rivers in terms of pollution and eutrophication. An inland sea is also an area where the impact of the surrounding inland tends to appear quite easily. Because of the vulnerability of inland seas, various domestic as well as multilateral frameworks for conservation have been developed.

The Seto Inland Sea of Japan, for example, has been considered for conservation since 1973 when the Interim Law for Conservation of the Environment of the Seto Inland Sea was legislated. In 1974, the United Nations Environmental Programme (UNEP) launched the Regional Seas Programme (RSP) in the wake of the 1972 United Nations Conference on the Human Environment held in Stockholm, Sweden. This resulted in Northwest Pacific Action Plan (NOWPAP) in 1994. The overall goal of the NOWPAP is "the wise use, development and management of the coastal and marine environment so as to obtain the utmost long-term benefits for the human populations of the region, while protecting human health, ecological integrity and the region’s sustainability for future generations" (UNEP 2013). The geographical scope of NOWPAP covers the marine environment and coastal zones from about 121 degrees to 143 degrees east longitude, and from approximately 33 degrees to 52 degrees north latitude.

The Sea of Okhotsk, however, has not been included in any domestic or multilateral framework for environmental conservation. The situation has made it difficult to protect the Sea of Okhotsk from transboundary environmental problems. The first bilateral agreement on the conservation of the ecosystem in the neighboring region between Japan and Russia was signed in May 2009. It will be a great step forward for the future of sustainable use of marine resources in the Sea of Okhotsk. However, the Sea of Okhotsk is strongly connected with the Amur River, and therefore the conservation of the Sea of Okhotsk must be undertaken in cooperation with conservation measures applied for the Amur River Basin. This indicates that the conservation and sustainable use of the Amur-Okhotsk ecosystem should be established by a collaborative effort.
between Mongolia, China, Russia, and Japan.

2. Establishment of the Amur-Okhotsk Consortium

On 7-8 November 2009, the international symposium “Environmental Conservation of the Sea of Okhotsk: Cooperation between Japan, China, and Russia” was held at the conference hall of Hokkaido University. Participants from academic as well as administrative organizations discussed the fertility and vulnerability of the Sea of Okhotsk with citizens of Japan. Based on two days of discussions, the participants proposed a joint statement in three languages\(^1\). Here, the participants agreed, 1) to promote the sharing of information to the degree that can be disclosed by researchers of each country; 2) to make efforts toward cooperative environmental monitoring; and 3) to facilitate robust discussions that transcend borders toward the establishment of environmental conservation and sustainable use of the resources of the Amur River Basin and the Sea of Okhotsk.

The Amur-Okhotsk Consortium was established on this occasion with the aim of discussing issues grounded in scientific knowledge. The purpose was to share a common recognition through the exchange of opinions and discussions on the natural environment of the Sea of Okhotsk and the Amur River Basin. The consortium welcomed members from Mongolia in 2010 and it became an academic network between Mongolia, China, Russia, and Japan.

3. Management of the Amur-Okhotsk Consortium

Following the joint statement mentioned above and the international workshops among the participating members were held during 1-2 November 2010 and during 5-6 November 2011. A total of 26 scientific as well as social scientific presentations were given and a total of 223 participants joined during the symposium. The symposium was principally supported by Mitsui Co. Ltd. Environment Fund, which was essential for continuation of the activities.

It was 11 March when the 2011 earthquake off the Pacific coast of Tohoku region occurred and destroyed a large portion of the Pacific coast in the northern part of the main island of Japan. The extraordinary tsunami resulted in the Fukushima Daiichi nuclear disaster, which was the largest nuclear disaster since the Chernobyl disaster of 1986. The surrounding land and ocean were seriously polluted by deliberate venting to reduce gaseous pressure and deliberate discharge of coolant water into the sea.

It was decided by the consortium’s representatives that the impacts of the Fukushima Daiichi nuclear disaster should have been immediately released by the Japanese scientists, as a failure to do so would otherwise jeopardize discussions between Japan and other parties about any future transboundary environmental issues in the Amur-Okhotsk region. It was considered an obligatory action for the Japanese scientists to disclose as much information as possible at an early stage. This was an important moment for the Amur-Okhotsk Consortium as to whether it would be a real multilateral academic network in Northeast Asia.

As a result, five sessions were allocated to the following important topics: 1) environment in the Amur River Basin and its changes; 2) environment in the Sea of Okhotsk and its changes; 3) the Fukushima

\(^1\) For the establishment of the Amur-Okhotsk Consortium, see http://amurokhotsk.com/.
Daiichi Nuclear Power Plant accident and its impact on the marine environment; 4) socio-economical analyses of the Amur-Okhotsk region; 5) international cooperation for environmental conservation in the Pan-Okhotsk region. Concluding general discussions were made for the sharing of environmental data sets previously obtained by individual institutions. As the nitrobenzene pollution in the Amur River system in 2005 and radioactive pollution on the Pacific coast of Japan cannot be solved by any individual country, multilateral cooperation across state borders is essential to solve these problems. The transboundary environmental problems occurring in Northeast Asia are concern of every country and thus best solved through close collaboration between countries.

The role of the Amur-Okhotsk Consortium was then discussed. Some insisted that the consortium should be responsible as an international archive center for transboundary environmental data sets, but the majority of participants preferred the consortium to work as a portal site of existing data sets scattered all over the world. Namely, the Amur-Okhotsk Consortium is expected to connect both the information and data of the Pan-Okhotsk region to facilitate the efficient utilization of data sets by potential users and stakeholders.

Activities of the Amur-Okhotsk Consortium planned for the immediate future were also discussed during the general session. It was proposed and approved to hold an international joint cruise on the Amur River in the summer of 2012. The third international meeting of the Amur-Okhotsk Consortium was proposed and approved to be held most probably at Vladivostok, Russian Federation, in 2013.

Most of the presentations and the content of the general sessions were reported in English in the form of the “Proceedings of the Second International Meeting of Amur-Okhotsk Consortium 2011” in March 2012 (AOC 2012).

References


MOUNTAINS
Framing Mountains for Regional Environmental Cooperation: The Case of the Carpathians

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1. Introduction

Mountains have traditionally been the objects of local and national politics. They have been the target of various policies in different fields, such as agriculture, spatial planning, tourism, or nature conservation. Over the last two decades, a large network of scientists, non-governmental organizations and mountainous countries have promoted the cause of mountains on the global agenda (Debarbieux and Price 2008; Rudaz 2011). In this sense, the 1992 Rio Conference was an important step in the recognition of mountains on the international stage. The adoption of a specific chapter for mountainous regions – Chapter 13 within the Agenda 21 – recognized for the first time that they deserved international attention and required the implementation of specific sustainable development policies. In 1998, the United Nations General Assembly (UNGA) declared that 2002 would be the International Year of Mountains (IYM). A number of events, research and reports were launched to this end. Still in 2002, an international partnership for sustainable development in mountainous regions was launched during the World Summit on Sustainable Development (WSSD) in order to facilitate direct coordination and cooperation between the interested states and various stakeholders (Debarbieux and Price 2008: 154).

Financially supported by the Swiss Development Cooperation (SDC), scientific cooperation on mountains has also been institutionalized progressively and globally. Following the adoption of Chapter 13, a first review of the implementation of the Agenda 21 in mountainous regions was published in 1997 (Messerli and Ives 1997). An international research partnership has been implemented (Mountain Research Initiative) and regional scientific structures have been developed in different parts of the world. The definition of mountainous areas rapidly came to be seen as a challenging but necessary task for the scientific community in order to organize data, analysis and communication globally (Debarbieux and Price 2008: 157). With the development of remote sensing techniques, the UNEP World Conservation Monitoring Centre has been able to propose a global classification which has largely been taken up by international institutions since then (Kapos et al. 2000).

This growing globalization of political and scientific mountain issues has been accompanied by the launch of several regional initiatives which identified mountain ranges as a relevant management field of action. This political objectification of mountain ranges (e.g. mountain ranges as a relevant object of politics) has been concomitant to the evolution of paradigms in the field of nature conservation, from the protection of species to the integrated management of ecosystems. New models (ecoregions, bioregions, hotspots) have progressively been developed and promoted by international non-governmental organizations. They have reorganized nature conservation around the identification of these new management...
areas. The World Wide Fund for Nature (WWF) has, for instance, identified 238 priority ecoregions\(^1\) (the so-called “Global 200”) on which to focus its action on (Olson and Dinerstein 1998). Mountain ranges have also been the object of ecoregional initiatives. In 1997, the Yellowstone to Yukon Conservation initiative (Y2Y) developed a wide network of protected areas on the whole mountain range. Other political initiatives, mainly in Europe, started to develop coordinated integrated policies at the scale of mountain ranges (Debarbieux and Rudaz 2010). This is the case in the Alps where an international convention was signed in 1991 to promote sustainable development policies at the Alpine scale. This is also the case in the Carpathians where a framework convention for the protection and sustainable development of the Carpathians (the Carpathian Convention) was signed in 2003 following the Alpine model. This is precisely the modalities of environmental regional cooperation around the Carpathians that we wish to study in this paper.

Over the past fifteen years indeed, several initiatives have identified the Carpathian mountain range as a relevant spatial frame to implement transnational environmental policies. This paper shows that these initiatives have mainly been driven by international governmental and non-governmental environmental organizations guided by different interests. We demonstrate that the framing of these Carpathian projects has varied from spatial, thematic and organizational perspectives to their degree of institutionalization. Nevertheless, they are more and more directed towards the implementation of coordinated sustainable development policies. Lastly, we argue that these various projects articulate well under the banner of the convention for three main reasons. First, the Carpathian Convention succeeded in combining development objectives with nature conservation from the very beginning. Second, the various international organizations active in the Carpathians have developed specific skills in a rather complementary way. Third, the Interim Secretariat of the Carpathian Convention (ISCC) played an active role in coordination and monitoring of these various initiatives.

This paper is divided into three parts. In the first part, I briefly introduce the Carpathian mountain range in its European context. I highlight the environmental challenges and the role of the European Union in this regionalization process. In the second part, I discuss three regional initiatives driven by three different organizations active in the environmental field: the Carpathian EcoRegion Initiative (CERI, formerly CEI), the Carpathian Convention and the Carpathian macro-regional strategy. Each of these initiatives has identified the Carpathian mountain range as a relevant spatial framing to implement their policies but with rather different modalities of framing. The third part briefly opens up avenues with respect to the articulation of the various initiatives and the role of the interim secretariat (ISCC).

This paper is based on information gathered during a three-year period of research, more specifically three months of participative observation on daily operations of the ISCC (Vienna), and on several interviews with officials of the ISCC, United Nations Environment Programme Regional Office for Europe (UNEP-ROE) and the WWF Danube-Carpathian Programme Office (WWF-DCPO).

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\(^1\) WWF defines “ecoregion” as “a large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions” (WWF 2013).
2. The Carpathians in the Wider European Context

The Carpathian Mountains is one of the largest mountain ranges in Europe. It covers areas in seven countries of Central and Eastern Europe (CEE): the Czech Republic, Hungary, Poland, Romania, the Republic of Serbia, Slovakia, and Ukraine. The largest part of the Carpathians is located in the territory of Romania. The highest points culminate between 2,500 and 2,700 meters. The Carpathian Mountains were relatively underdeveloped and preserved from human influence during the communist period. A large portion of the range is covered by forests and the Carpathians are known for their rich biodiversity and their large community of big mammals, especially large carnivores (UNEP 2007).

The end of the communist era in the late 1980s resulted in an abrupt economic and political transition, which has raised a number of issues for nature conservation in the region. A number of international non-governmental environmental organizations (INGEOs) have rapidly identified the potential of development for their activities in a region with striking natural characteristics but low economic capacity, a political apparatus in reconstruction and a relatively weak civil society. During the 1990s, the region has seen an increasing deployment of international environmental institutions searching for new opportunities of development (Carmin and Hicks 2002; Carmin and VanDeveer 2004). NGOs like the WWF, Friends of the Earth or the International Union for Conservation of Nature (IUCN) opened new offices and started to implement environmental programs. New financial mechanisms and capacity building institutions (like the Regional Environmental Center, REC), most of them supported by the European Union (EU), were created during this period.

In the 2000s, EU accession perspectives (the Czech Republic, Hungary, Poland and Slovakia entered the EU in 2004, Romania in 2007, and the Republic of Serbia officially applied for EU membership in 2009) have profoundly influenced environmental policies of these states. EU accession requires the harmonization of laws, rules and practices with what is commonly termed the *acquis communautaire*, the whole body of European Union laws. Environment is one important chapter that must be transposed into national law. This was undeniably an important incentive for the Carpathian states to improve their environmental policies.

In parallel, the European Commission has encouraged regional initiatives of cooperation through regional cooperation programmes (INTERREG). Since 1997, a specific section of these programs has concerned transnational cooperation, particularly in the environmental field. The Carpathian region benefited from one of these rounds of funding in the implementation of the Carpathian Convention. 2 Regional environmental cooperation in the Carpathians must therefore be placed in its wider economic and political context. Different factors help us to understand the specificities of regional cooperation around the Carpathian mountain range: the end of the communist era, economic development, the strong presence of international

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2 The Carpathians were originally part of one of the thirteen spaces of funding identified by the European Commission (CADSES: Central Adriatic Danubian and South Eastern European space). During the fourth programing period 2007-2013, the Commission proceeded with the reorganization of these financial spaces and divided the Carpathians into two distinct entities (Central Europe and South East Europe).
environmental institutions and of external financial mechanisms, and lastly, the political and financial role played by the EU. In the next section, I will briefly introduce the three regional environmental initiatives selected and discuss their respective framings.

3. Framing the Carpathian Region

3.1. The Carpathian Ecoregion Initiative

The WWF has been the first international environmental organization to develop a specific program throughout the entire Carpathian region. Through its Danube-Carpathian Programme Office (WWF-DCPO) in Vienna, the organization launched the Carpathian EcoRegion Initiative (CERI) in 1998. The CERI is a partnership of 50 organizations (governmental and non-governmental, academic and scientific) from the seven Carpathian countries, which are committed to promoting conservation and sustainable development in the Carpathians. The program endorsed the ecosystem approach as the primary framework for actions and promoted the concept of “ecoregion” to spatially define the Carpathians entity. The Carpathians were the WWF’s first ecoregional experience in Europe. The Carpathian ecoregion stretches beyond the Carpathian Mountains and includes the adjacent foothills.

Between 2000 and 2001, a detailed assessment of biodiversity and socio-economic aspects in the Carpathian region was carried out thanks to several expert meetings and the institutionalization of a large network of environmental actors. Following the assessment, the CERI adopted long-term objectives and an action plan for the conservation and sustainable development of the region. Although the program officially endorsed a sustainable development perspective, it was mainly based on nature conservation objectives.

Based on CERI’s activities since 1999, the WWF-DCPO, in cooperation with the Romanian government and the United Nations Environment Programme (UNEP), organized in April 2001 an inter-ministerial Summit on Environment and Sustainable Development in the Carpathian and Danube Region in Bucharest. The Bucharest Summit provided international recognition for the WWF ecoregion program and increased governments’ interest in the region. It launched the process that led to the adoption of the Carpathian Convention.

3.2. The Carpathian Convention

The Carpathian Convention process has been mainly driven by UNEP. UNEP’s interest in the Carpathian region was closely linked to the declaration of the International Year of Mountains (IYM) in 2002. The UN program promoted the development of regional conventions as part of its overall strategy for the IYM (Gabell in press). At the request of the governments of Armenia, Kyrgyzstan and Ukraine, the UNEP-Regional Office for Europe (UNEP-ROE) launched the European Mountain Initiative, which provided an umbrella for three regional projects around mountain ranges in the Carpathians, the Caucasus and in Central Asia. After the first phase of consultations with different governments involved in these initiatives, the UNEP-ROE formally assisted and facilitated the consultation and negotiation processes towards the development of regional convention for the protection and sustainable development of these mountain ranges.

After a very short round of negotiation between 2001 and 2003, the Carpathian Convention was signed in Kiev in November 2003 by the seven Carpathian
countries. The Convention supports the protection of the environment and the sustainable development of the Carpathian region. It was quite clear from the first informal meeting in 2001 in Kiev that the governments would not support an approach focusing exclusively on biodiversity. The governments were worried about hindering economical development in the region by over-emphasizing the need for nature protection. The experts rapidly crafted a framework agreement, which provided a general umbrella for an integrated approach including a wide range of topics. Sustainable tourism, biodiversity protection and sustainable economic development were identified as priorities for action. The specific thematic areas of cooperation in the Carpathians had to be further specified by the Conference of the Parties (COP) through the adoption of future protocols.¹

Interestingly, the Carpathian Convention does not have a formal spatial delimitation. Despite the common political will to focus on mountainous areas, the negotiators failed to spatially define the boundaries of the region (Fall and Egerer 2004). The Convention therefore applies to “the Carpathian region, to be defined by the Conference of the Parties” (Art. 1).² No agreement has been reached yet. This example demonstrates how the translation of a global definition to national contexts should not be conceived as a straightforward process. Instead, the identification and delimitation of these natural entities always entails processes of translation, appropriation and negotiation between the actors involved.

The Carpathian countries also failed to agree on the administration and location of the permanent secretariat. As a result, an interim secretariat has been in service since 2004 by the UNEP-ROE in an outpost office located in Vienna. In order to carry on this task, the UNEP-ROE is assisted by the European Academy of Bolzano (EURAC), which sent two of its members to help in project making and to develop new partnerships.

### 3.3. The Carpathian Macro-region

Since 2007, a new tool of territorial cooperation has been developed by the European Commission: the macro-regional strategies. These tools for good governance are based on large territorial areas that however have no precise delimitation. They require no new funding, no new institutions and no new legislation (Samecki 2009). These strategies have been perceived as coordination tools in order to promote integrated policies and a better articulation of the different spaces of actions within the same perimeter. The first macro-regional strategy has been developed for the Baltic Sea region, which had a long tradition of regional cooperation particularly in the environmental field (VanDeveer 2011). The European Union Strategy for the Baltic Sea Region (EUSBSR) was rapidly followed by a macro-regional strategy in the Danube region. The broadly admitted spatial extent of the EU Strategy for the Danube Region encompasses the Carpathian Mountains.

This new instrument has rapidly been perceived by the Interim Secretariat of the Carpathian Convention (ISCC) as a means to bring the Convention closer to the EU. It was a way to better integrate the Carpathians into the wider European

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¹ Three protocols have already been adopted: the biodiversity protocol, which went into force in 2010, as well as the forest and sustainable tourism protocols, which were adopted in the third Conference of the Parties in 2011.

This brief overview allows us to highlight three initiatives that have taken the Carpathian mountain range as a relevant scale to implement transnational integrated policies. Each one has framed the Carpathians in a very different manner, as summarized in Table 1. This comparison leads to several observations that I wish to sum up here. First, environmental regional cooperation in the Carpathians has mainly been driven by a network of international institutions. The European Union, despite not being directly implicated in these initiatives, played a major political and financial role in this regionalization process. Second, thematic framings seem to move from purely conservation objectives to include broader sustainable development issues. This thematic move seems to be performed through the enlargement of the Carpathian Mountains’ perimeter to include adjacent metropolitan areas in cooperative efforts. Softer forms of cooperation are also being researched.

These initiatives were articulated in a complementary way under the most institutionalized form of regional cooperation (e.g. the Carpathian Convention) for three main reasons. First, from the beginning the Carpathian states have been very careful to balance conservation and sustainable development priorities. The Carpathian Convention offers them a large framework of cooperation to include all the different interests in the region. Second, every leading organization has developed specific complementary skills. The WWF-DCPO has a strong field presence and has institutionalized a large network of local and regional stakeholders. It is also recognized as a science-based organization with a long history of nature conservation. The WWF-DCPO works closely with the Convention on implementation of specific projects. Conversely, the UNEP-ROE has benefited from the intergovernmental status of its institution to drive the negotiation of the Carpathian Convention. It also has a long history of treaty making and is involved in a number of regional environmental treaties in Europe and across the world, which ensures privileged contact and partnerships for the Carpathian Convention. The UNEP-ROE is also administering the Secretariat of the Carpathian Convention on an interim basis.
and opened a dedicated office in Vienna for this task. Lastly, the ISCC has structured a large network of scientific and political international institutions, which has helped to establish the Carpathian region into the European regional map. The ISCC has also developed a small office specifically focusing on project making to foster the implementation of the Convention. In this respect, it works closely with the WWF-DCPO and its network. Lastly, the macro-regional strategy and the Convention are driven by the same actor, UNEP-ISCC. The organization has kept the definition and the implementation of the two-level strategy in its own hands, conceiving them in a rather complementary way. It contrasts with the Alpine process, where at least three different macro-regional projects are under consideration and two of them have been explicitly at odds with the Alpine Convention.

Table 1: Regional Environmental Cooperation in the Carpathians

<table>
<thead>
<tr>
<th>Framing Initiatives</th>
<th>Spatial</th>
<th>Thematic</th>
<th>Organizational</th>
<th>Degree of Institutionalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carpathian Convention (2003)</td>
<td>Mountains</td>
<td>Conservation and sustainable development</td>
<td>UNEP-ROE and the nation states party to the treaty</td>
<td>International treaty</td>
</tr>
<tr>
<td>Carpathian Macro-region (2011)</td>
<td>Carpathian Space</td>
<td>Sustainable development</td>
<td>The macro-regional process is encouraged by the European Commission at the European level; the Carpathian strategy is driven by the ISCC</td>
<td>Action plan</td>
</tr>
</tbody>
</table>

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The Great Mountain Game: Regional Governance in Central Asia

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1. Introduction

In the early 1990s, Central Asia was a region at the periphery of the former Soviet system that had just collapsed. However, the region came back strong on international political agendas for two key reasons: energy (and to a lesser extent mineral resources) and the “war against terror” initiated in the post 9-11 era. The new states emerging from the dissolution of the USSR had to redefine their cooperation at the regional level. They also entered the international political arena and came on board with the simultaneously emerging global agenda promoting sustainable development. In this latter context, specific attention was devoted to mountains and this resonated specifically with the Central Asian region.

In this paper, I focus on sustainable development strategies in relation to mountain areas and their resonance at the regional level. I discuss the three main ways regional cooperation has been conceived in relation to sustainable mountain development. First, I address the core regional issue of transboundary management of water, where mountains are conceived as water towers. Second, I consider the positioning of Central Asia towards the global mountain agenda, i.e. an agenda for mountains elaborated at the international level. Third, I discuss the process of up-scaling local initiatives promoting sustainable mountain development.

Because international actors play a decisive role in these processes, I picked the title “The Great Mountain Game” in reference to “The Great Game”, which is the name given to the rivalry between the British and Russian Empires to extend their influence within the region, a rivalry that extended for about a century, between 1813 and 1907.

2. A Brief Overview of the Region of Central Asia and Its Mountains

Central Asia is a vast region with blurred borders extending between the Caspian Sea and China, and between Afghanistan (AF) and Russia (RU). With the collapse of the USSR, the region has come to be defined as the area covered by the five republics of the former Soviet Union: Kazakhstan (KZ), Kyrgyzstan (KG), Tajikistan (TJ), Turkmenistan and Uzbekistan, and it is this latter definition that I am going to refer to. These five republics emerged less than a century ago (1924) out of the former Turkestan Autonomous Soviet Socialist Republic established in 1918. These borders were drawn along ethnic lines by Joseph Stalin, at the time Commissar for Nationalities. This delineation based on ethnicity explained the presence of territories in other countries, called “mountain enclaves” (Hughes 2012: 47). During the Soviet era, they drew little attention, but with independence, they persisted and led to more tensions.

With the collapse of the Soviet system, the region has faced major changes, mainly the transition from a planned to a market economy, as well as a change in political organization with feeble attempts to promote democracy. In an enthusiastic publication (2009) about Central Asian
countries, the EU Council stated that “They have established statehood, safeguarded multi-ethnic understanding and inter-religious communication. By joining the OSCE, they have subscribed to the Organization’s values, standards and commitments. By signing the United Nations Millennium Declaration they have set themselves ambitious goals”. However, it is hard to generalize statements for Central Asia as a region. The newly independent states of Central Asia took very different paths in styles of government and arrived at different political systems. However, strong concentration of power in the hands of a political elite remains the trend, with the notable exception of Kyrgyzstan (Roy 2005). The Central Asian countries also took different economic paths. Kazakhstan, Uzbekistan and Turkmenistan benefit from capital flows related to their energy resources, while Kyrgyzstan and Tajikistan face continued economic difficulties.

With independence, there was a shift from one centralized system to five independent states. The collapse of the USSR did not reinforce regional cooperation. On the contrary, nationalism has been reinforced since independence (Roy 2005). International organizations try to stimulate regional collaboration, like the United Nations Special Programme for the Economies of Central Asia (SPECa) launched in 1998 and which aims to strengthen subregional cooperation in Central Asia and its integration into the world economy. Regarding sustainability, the Interstate Commission on Sustainable Development in Central Asia was created in 1994. It launched an Action Plan (2001), a Framework Convention (2006) and a Strategy (2007-2008), all aimed at promoting the sustainable development of the Central Asia region.

Focusing specifically on mountains, when one looks at the region overall, mountains cover about 20% of Central Asia, i.e. 800,000 km². When one looks at the country profiles, we come to the following statistics: 93% of Tajikistan, 90% of Kyrgyzstan, 20% of Uzbekistan, 10% of Kazakhstan, and 5% of Turkmenistan are mountainous (Hughes 2012: 18). We can see that Tajikistan and Turkmenistan have almost inverse percentages. The mountains of Central Asia comprise not a single mountain range but several. Two of Asia’s major mountain ranges are the Pamirs in Tajikistan and the Tien Shan in Kyrgyzstan. Mountain ecosystems also cover parts of Eastern Kazakhstan (Kazakh uplands, Djungar Alatoo, Tarbagatai and Altai), southeast Uzbekistan (Western Tien Shan and Gissar) and Turkmenistan (Kopet-Dag and Kugitang), and extend into Afghanistan (Hindu Kush) and China (Eastern Tien Shan and Pamir). Several are transboundary: Djungar Alatoo (KZ, RU), Tarbagatai (KZ, RU), Altai (KZ, RU, China), Tien Shan (KG, CN, KZ, UZ), Pamir-Alai (TJ, KZ, AF, CN), Gissar (UZ, TJ) and Kopet-Dag (UZ, Iran) (Hughes 2012).

3. Mountains, the Water Towers of Central Asia

At the regional level, the core issue is water. An administrative and technical matter during the Soviet period, water management has become a central political matter since the independence of the Central Asian republics. Indeed, the political volatility of Central Asia is highly related to water usage and its distribution among countries. The Environment and Security Initiative (ENVSEC), a joint initiative by a number of agencies (UNDP, UNEP, OSCE, NATO, UNECE and REC), has launched initiatives to reduce these tensions.

The mountains of Central Asia play the
role of water towers, a classical framing of the mountains (Debarbieux and Rudaz 2010). About 90% of the water of Uzbekistan and Turkmenistan comes from the mountains outside these countries. At the heart of the tensions between highland and lowland countries are the issues of energy accessibility and water usage for irrigation. Lowland countries need water during the summer for agriculture irrigation, while the upland countries release water in winter for energy generation through hydroelectric dams. During the Soviet times, things ran more smoothly as one centralized system was coordinating the water allocation and energy provision.

One of the things for which Central Asia is best known in the field of environment is the Aral Sea crisis, one of the most famous examples worldwide of water resource mismanagement. In the 1960s, the two major rivers feeding the Aral Sea (Amou Daria and Syr Daria) were diverted to irrigate cotton fields, making Uzbekistan one of the world’s biggest producers, and some agricultural production (rice, melons, cereals). About 90% of the river flow has been diverted for irrigation. By 2007, the Aral Sea was 10% of its original size. But this environmental disaster extends far beyond the sea, due to the salinization being spread throughout the whole region by winds.

To address the Aral Sea crisis, there was a call for regional cooperation. The Agreement on Cooperation in the Management, Utilization and Protection of Interstate Water Resources was signed in 1992 by representatives of the five Central Asian states. The agreement calls for the coordination of efforts to address the issue. It established an Interstate Commission to implement the agreement and it proposes annual plans for water allocations. One year after the agreement, the five countries signed the Agreement on Joint Actions for Addressing the Problems of the Aral Sea and its Coastal Area, Improving of the Environment and Ensuring the Social and Economic Development of the Aral Sea Region. The new agreement led to the creation of the Interstate Council for the Aral Sea, which is the coordinating body, and the International Fund for the Aral Sea, which is the implementing body and is considered a “key regional player in water and environmental cooperation” (Hughes 2012: 92). It works on the scale of the entire Aral Sea Basin and its motto “From the glaciers to the deltas”1 shows the interlinkages between upstream and downstream. The aim of the Fund is not only to manage water but more broadly “to improve the environmental and socio-economic situation in the Aral Sea Basin”.

The Aral Sea and the two major rivers (Amou Daria and Syr Daria) have attracted most of the attention, but there are hundreds of smaller transboundary river basins shared by riparian countries. In 2003, OSCE, UNECE and UNESCAP initiated the project for the Chu and Talas Rivers and this lead to the creation in 2006 of an international commission (Kazakhstan and Kyrgyzstan).

The framework of highland-lowland could extend beyond the topic of water and, notably, with the emerging concept of ecosystem services (Rudaz 2012), as evidenced, for example, by the mountains of Central Asia having been identified as a hotspot of biodiversity by the non-governmental organization Conservation International. In the Millennium Ecosystem Assessment, specific attention is devoted to mountains and the highland-lowland framework is considered as promising: “Maximizing highland-lowland complementarities is crucial for both

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1 See http://www.ec-ifas.org/.
upstream and downstream communities. Healthy mountain communities require linkages to lowland markets, and lowland populations need mountain people to serve as stewards for upland resources and watersheds” (Körner and Ohsawa 2006).

4. Positioning on the International Agenda

The countries of Central Asia became independent in 1991, each of them through their own national process. Even if Russia had and still continues to have a tremendous influence on the region, their world broadened tremendously. This is the time when they entered the international political arena as independent countries, looking for new partners for development. The year following their independence saw the organization of the United Nations Conference on Environment and Development (UNCED), held in 1992 in Rio de Janeiro and commonly known as the Earth Summit. The conference reflected the momentum in international cooperation towards sustainability and the international enthusiasm towards the event is reminiscent of Francis Fukuyama’s “The End of History”. With this background, we can observe that sustainability has ranked high and has been quickly integrated into the political agendas of Central Asia, whether followed by concrete actions or not.

The UNCED 1992 embodied the momentum of mountain advocates and enabled them to promote a global agenda for sustainable mountain development (Rudaz 2011). This lead to the inscription in Agenda 21, the action plan arising from the conference, of a chapter devoted to mountains – Chapter 13, “Managing Fragile Ecosystems: Sustainable Mountain Development”. Switzerland was instrumental in pushing this global mountain agenda and had to rely on its international “allies”, often landlocked mountainous countries to which it provided international aid. Switzerland had many points of contact with Central Asia. Indeed, a month before UNCED, Switzerland joined the International Monetary Fund and took the lead among a group comprising the Central Asian states among others and came to be known as Helvetistan – a name coined from the official name of Switzerland “Confœderatio Helvetica” and “stan”, meaning “country” and which the names of the countries of Central Asia have in common. Against this background, Kyrgyzstan rapidly emerged as a promoter of the cause of mountains in the international political arena. It is at the request of Kyrgyzstan that the UN proclaimed 2002 “International Year of Mountains”. Kyrgyzstan was eager in that role and organized the final and major event of the year: the Bishkek Global Mountain Summit.

“Mountains” could be a label mobilized to gain visibility in the international political arena. In the regional report for Central Asia evaluating the progress towards sustainable mountain development and presented at the Rio+20 Conference (2012), two major recommendations were formulated. It proposed “the creation of a mountain countries group under the auspices of the United Nations” and “the exchange of external debt for an equivalent investment in sustainable development” (Hughes 2012: 7).

This involvement in the global mountain agenda has impacts at national and regional levels, putting mountains high on political agendas, which is usually not the case. Indeed, few countries have policies focusing on mountains (Castelain et al. 2006). Following the declaration of the International Year of Mountains, Kyrgyzstan
enacted a law on mountain territories (2002), further supported by a government decree (2007). Tajikistan is in the process of designing its own national mountain law. These laws focus on poverty reduction and provide financial support for infrastructure in order to improve the standard of living in mountain areas. At the regional level, the Regional Sustainable Development Strategy for Central Asia stated that the “prosperity of the Central Asian region depends in many aspects on the health condition of the Pamir and Tien Shan mountainous ecosystems”. The Regional Environmental Action Plan approved in 2001 by all Central Asian states also treats mountain ecosystems as a regional environmental priority. And lastly, “mountain ecosystem degradation” is one of the five priority areas of the Framework Convention on Environmental Protection for Sustainable Development in Central Asia.

5. Up-scaling Local Mountain Development Projects

Since independence, public expenditures decreased drastically. For instance, regarding health and education, spending is about a quarter of what it used to be during Soviet times (Hughes 2012: 10). Indeed, the USSR provided significant economic and social aid to the whole region, including mountain communities. The newly independent states could not maintain this level of support to these remote areas. With the introduction of the market economy, many jobs were lost, with the consequence of the out-migration of the male working force.

Poverty reduction is at the core of many international programs. International aid focuses on economic and social reforms and resource management. Numerous international aid agencies work at the local level, involved in small mountain development projects, as “mountain” is an appealing label for some donors. Sustainable development is most of the time the overarching principle of these projects. Many of them imply a political dimension, as they aim to promote civil society, capacity building and, more broadly, empowerment of mountain communities.

A key example is the Central Asian Mountain Partnership (CAMP), initiated by the Swiss Agency for Development and Cooperation (SDC) and focusing on Kyrgyzstan, Tajikistan and Kazakhstan. The sponsor, SDC, states the positive influence of the international recognition of the importance of mountains: “This project became especially relevant in the wake of the year 2002 which was declared the International Year of Mountains by the United Nations. At that time Central Asian states received a rare opportunity to attract the world’s attention to the problems of rural people living in mountain areas.” With sustainable mountain development as an agenda, CAMP is active in four main areas: resource use, product development and marketing, village development, and policy dialogue. The basic assumption is that better management of resources would lead to better living conditions for mountain communities. A central feature of the program is the support of local organizations promoting policy dialogue to address development and conservation issues.

The Alliance of Central Asian Mountain Communities (AGOCA) was created parallel to the Bishkek Mountain Summit (KG), with the aim to benefit from the impetus launched by this event concluding the International Year of Mountains (Nikonova et al. 2007). It is a network of

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mountain communities from Kyrgyzstan, Tajikistan and Kazakhstan who exchange information and experience, with the aim of implementing sustainable mountain development. There was an initial idea for the Alliance to also be a lobby for the cause of mountains in the region, but this has been dropped. CAMP played a decisive role in implementing AGOCA. By having innovative communities involved in sustainable mountain development, the idea is that exchanges of good practices could spread throughout the region. In this context, capacity building is an essential feature of the process.

The Pamir-Alai Land Management project (PALM) follows a similar logic. It works at the scale of the mountain range, which is transboundary between Tajikistan and Kyrgyzstan. The project was initiated by the two countries, the Global Environment Facility, the United Nations Environment Program and the United Nations University. It promotes joint development and conservation objectives under the overarching aim of sustainable development. Having the states on board (TJ, KG), PALM definitely enhanced regional cooperation. However, a key feature is also the mobilization of the local level, as 114 micro-projects were also promoted. Another key feature of PALM is that upscaling and replication in other mountain regions of Central Asia of the lessons learned are a stated objective. Both CAMP and PALM believe in the capacity of local mountain communities to be stewards of resources for the benefit of people within the region and beyond.

6. Conclusion

For historical reasons, regional cooperation in Central Asia has been difficult. Mountains emerged as an issue that could enhance further regional cooperation. In this paper, I showed that the regional cooperation referring to mountains in Central Asia is embedded in an international agenda for mountains framed under the overarching principle of sustainable development.

National mountain laws (KG, TJ) could secure the political recognition of mountains. However, it seems that the mountains of Central Asia will remain on the political agenda, when connected to a broader global mountain agenda. As stated in the report on Central Asia carried out for the Rio+20 Conference, “the Central Asian mountains provide an astonishing array of essential ecosystem goods and services not only to mountain inhabitants but also to people in the lowlands and around the globe” (Hughes 2012: 6). The label “mountains” provides a positioning both for mountain states and mountain communities of Central Asia through which to present themselves as stewards of resources whose importance extends far beyond the region.

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EXTREME CLIMATE EVENTS
Extreme Events, Regulatory Style and Regional Environmental Governance

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1. Introduction

Extreme events are increasingly prominent in society. Both experienced environmental catastrophes, such as hurricanes, droughts and flooding and anticipated ones (such as the consequences of climate change) are reported in the media, discussed in public arenas and negotiated about in political discussions. The focus is both on how to mitigate the events that occur and how to minimize the consequences of those events that it is assumed will occur (by developing adaptation capacity and coping strategies).

A changing climate has widespread consequences, for example extreme weather. An important task is to decrease exposure and vulnerability, and increase the resilience of systems in order to minimize the adverse effects of climate-related extreme events. Even if many extreme events cannot be avoided or mitigated, regulation can make systems more robust.

This presentation focuses on extreme events and their regulation. Three questions are in focus: What is an extreme event? To what extent are they preventable or at least manageable? And, what role do regions play in regulating extreme events?

2. What is an Extreme Event?

An event is something which occurs somewhere and sometime, that is, a phenomenon that manifests itself in time and space.

An extreme event is when something is seen as extraordinary. It could be in terms of low probability (e.g. a total solar eclipse) but most often in terms of high consequences (threat to vital functions of a system). Flooding may, for example, occur regularly in a region, but nevertheless it is seen as an extreme event if its consequences are disastrous. I will argue that an extreme event is an event that threatens the normal functioning of an organization, system or whole society.

The main cause of an extreme event can be located within nature (e.g. geophysical events such as earthquakes) or society (e.g. power outages, industrial disasters). However, because the definition of extreme events relates to their consequences, a cause cannot exclusively lie within nature itself. A social system may contain the key factor that causes a geophysical event to develop into a catastrophe. Thus, an extreme event is not external to society but internal to it; it concerns a system’s functioning, its vulnerability, robustness, resilience and adaptive capacity.

The character of an extreme event can either be creeping/gradual (small-scale events spread in time and/or space resulting in an extreme event) or acute/sudden (one major cause resulting directly in an extreme event) (Peijun, Jaeger, and Ye 2012).

The consequences of an extreme event can be of different kinds; economic, environmental, social, political and cultural. The partial reactor meltdown at Three Mile Island in 1979 resulted not in
any large radioactive fallout, but in great economic loss. It is still the widest imbalance on record between the scale of an advisory and an actual evacuation (3,500 people were recommended to evacuate but some 150,000 actually did) (Houts, Clearly, and Hu 1988; Walker 2004).

The consequences can differ in both magnitude and range. Some extreme events can be restricted to particular geographical areas whereas others can be restricted to certain kinds of systems that exist in most parts of the world. Irrespective of whether an extreme event stems from a geophysical event or from the failure of a technical system, its consequences can be restricted or spread. The volcanic eruption at Eyjafjallajökull, Iceland, in 2010 resulted in cancellations of many European flights: in total 26 European countries issued restrictions on flights. Thus, even if certain geophysical events (such as flooding, earthquakes and volcanic eruptions) do not happen everywhere, their consequences may be felt globally. Likewise, many technical systems are spread around the world, which means that operational failures can occur around the world. On the one hand, they may have geographically restricted consequences, primarily hitting the geographical surroundings of particular parts of the system. On the other hand, the consequences of a technical system failing can also have global reach. There are currently 435 nuclear power reactors in operation in 30 countries on four continents, with 64 new reactors under construction (most of them in China, the Russian Federation, India and Republic of Korea) (IAEA 2012). Nuclear disasters have occurred in the UK (1957), Russia (1957), the US (1979), Ukraine (1986), and Japan (2011). Each had great consequences for the area in which they were located, but the disasters also had impacts far beyond the area in which disaster occurred. The spread of consequences is due to global interconnections, which means that an extreme event occurring in a particular geographical area may affect wider economic and political systems. An example of this is that the Fukushima disaster (2011) resulted in a political decision in Germany to decommission its nuclear power program within eleven years.

Extreme events may be possible to foresee, but not necessarily in any detail. Some systems are more prone to result in extreme events (Perrow 1984) than others and some parts of the world are more frequently plagued by extreme events. At the same time, it is hard to predict when and where an extreme event will occur and impossible to predict its impacts. Hurricane Sandy in October 2012 was predicted, and public agencies issued recommendations and instructions. Nevertheless it cost 253 lives, left more than 200,000 homeless and caused estimated damages of US $66 billion (making it the second-costliest Atlantic hurricane in history).

Extreme events are observable, at least in retrospect, but not necessarily by all. Whereas storms, earthquakes, wildfires and industrial disasters are easily observed, other extreme events are not. The cause-effect relationship may be hard to determine and understand, and technical equipment and professional expertise may have to be involved in order to explore the consequences as well as trace the causes of an extreme event. The dioxin disaster in Seveso (1976) was only detectable through chemical and medical expertise (Kleindorfer and Kunreuther 1987). The radical increase of death and unhealthiness in the Ojibwa Native American community was originally interpreted as being caused by alcohol
abuse, and only four years later it was discovered that a paper and pulp plant eighty miles upstream of the Wabigon River had poisoned the community’s wells (Shkilnyk 1985). Methylmercury, which was later found in the wells, cannot be smelled, tasted or seen, and it is also hard to locate in human tissue by any clinical test short of autopsy. Thus, the occurrence, causes and consequences of an extreme event may in certain cases be hard to ascertain for both residents and authorities.

Extreme events can trigger learning. Experience of an extreme event can be used to reduce exposure, strengthen resilience and develop regulatory capacities to handle unexpected situations, thereby decreasing the vulnerability of a system. Thus, even if extreme events cannot be fully prevented or even predicted, it is possible to develop more robust systems which are less prone to generate extreme events.

Some types of extreme events are global phenomena, connected to characters and systems that are inherent in all human societies. Other extreme events are regional; associated with spatial, social and cultural characters of a particular region, or national, connected to a particular country. Lastly, there may be extreme events that are local; associated with a particular community’s way of functioning. The oil disaster caused by the Exxon Valdez running aground in Prince William Sound (1989) resulted not only in a wider ecological catastrophe, but also had the consequence that some 20 local fishing communities in Alaska were devastated (Picou, Gill, and Cohen, 1997). In another example, the flood that devastated Buffalo Creek, USA, in 1972 killed 125 people and left 4,000 homeless (Eriksson 1976).

**Conclusion:** An extreme event is an event that threatens the functioning of a system, community or society. Extreme events are always tied to context: a given system may be able to cope with certain unplanned incidents, preventing them from developing into catastrophes. On the other hand, another social system may be more vulnerable and have restricted coping capacity, which may lead to an event becoming extreme. This means that all kinds of extreme events – irrespective of whether they are of a geophysical, technical or social nature – are internal to society and are intrinsically related to the society’s character. Earthquakes, power outages, economic crises or socio-political disruption do not have uniform consequences. Instead their consequences are an expression of the system in which they occur. Extreme events are thus created within and by a social system. Consequently, the structure of a specific society as well as its regulatory style will make it more or less prone to generate extreme events.

3. **Are Extreme Events Manageable?**

Every system is subject to failure, irrespective of how hard organizations work to make things safe. Likewise, regulation is always imperfect. This means that extreme events will always occur, but their likelihood and consequences can be influenced. Regulation is one of the central means of mitigating extreme events.

The aim of regulation is not to eradicate risk, but to manage it, establishing boundaries for what is acceptable and developing systems for risk control (Hutter 2001; Lidskog et al. 2005). Regulation aims both to mitigate the frequency of risks, but also to develop adaptive capacity in order to manage risks. Thus, risk regulation aims to prevent certain negative events occurring (reducing their
likelihood) and, in the cases when they do occur, preventing them from becoming extreme (reducing the consequences).

Regulatory objects are not stable or complete entities, ready to be governed. Instead, in the regulatory process, diverse issues are constructed as regulatory objects. Regulation explicitly or implicitly creates demarcations and boundaries that make objects appear hazardous or harmless, safe or risky, natural or unnatural, important or unimportant. An issue can be ascribed certain characteristics, such as being of local or global concern, calculable or indeterminate, curable or incurable, robust or vulnerable. Three processes are found to be particularly relevant for trying to render risks governable: complexity reduction, construction of a spatial identity, and ascription of capabilities to actors (Lidskog, Uggla, and Soneryd 2011):

Reducing complexity: To make complex issues governable, complexity must be reduced and uncertainties managed. This can be done by delimiting the scope of the regulatory object; this is exemplified in various cases of environmental risk regulation, in which delimiting results in a regulatory process that emphasizes certain aspects of an issue and disregards others.

Constructing spatial identities: In a world organized in terms of territorial boundaries, to become subject to political action, environmental issues must be tied to particular administrative–geographical jurisdictions. Regulatory objects have to be spatially anchored in order to be manageable. Responsibilities, however, do not always follow predefined administrative boundaries. By ascribing a problem specific spatial characteristics, actors implicitly advocate a certain handling of the problem and define who should be responsible for it. Ascription of spatial identity is thereby a performative act, as localizing or globalizing an issue imbues it with meaning and creates opportunities for action (Czarniawska and Joerges 1996). Through shaping the spatial identity of an issue, it can be handled as a matter of international priority, the sole responsibility of domestic politics or a local problem for a particular municipality. Actors vie to bind issues to specific spatial identities, thereby creating incentives for certain types of political action or inaction, placing expectations regarding accountability on certain actors.

Ascribing capabilities: To make an issue manageable it is not enough to reduce its complexity and construct a spatial identity; legitimate actors competent to act in and be responsible for the regulatory process must also be identified. Reducing the complexity and constructing the spatial identity of an issue involves drawing boundaries and making demarcations. These boundaries influence what tasks, mandates, responsibilities, and identities are ascribed to various actors, resulting in certain actors being seen as central to the regulatory work, while others are seen as irrelevant. Various actors endeavor to influence both regulatory processes and their outcomes. In trying to achieve such impact these actors explicitly or implicitly position themselves in relation to others. Regulation provides a space in which actors’ identities are negotiated and shaped, resulting in the allocation of mandate and responsibility for regulating a given issue.

Deliberations between various actors about what is relevant regulation do not occur in a social vacuum, but are embedded in specific social contexts. The concept of a risk regulatory regime denotes the complex of institutions, norms, practices, and knowledge that
heavily influence the regulation of a particular risk (cf. Hood et al. 2001). Regimes not only determine the formulation of regulation but also its implementation, because regulation needs an institutional machinery to have power. Also, regimes influence not only how an issue should be regulated, but also affect the very definition of the issue (the regulatory object itself). This means that it is possible to explain why there are different regulatory styles within a country (due to different regimes for different sectors) and why there are different national styles of regulation.

**Conclusion:** Extreme events will always occur, but through regulation, the likelihood and consequences of extreme events can be mitigated. Regulating extreme events means that their complexity is reduced, that they are attached with spatial identities and that organizations are selected to be responsible for the handling of extreme events. Regulatory regimes emphasize that the invention of regulatory objects take place in specific contexts consisting of a complex of institutions, norms, knowledge, and practices.

**4. Does Region Matter?**

Regulation is always situated **within institutional contexts** that both enable and restrict the scope of action and shape regulatory activities. Regulation always takes place within a regulatory organization: an organization with the political legitimacy and the administrative complexity to develop regulation, the economic resources to carry it out and the coercive power to enforce it (Lidskog, Soneryd, and Uggla 2010). On an international level a regulatory organization can be an intergovernmental agency (e.g. the IAEA) or a political body (e.g. the UN); on a national level, a state or a public agency; on a sub-national level, a county board or a municipal board.

Regulatory organizations are always tied to **space:** their mandate and responsibility are connected to specific territorial areas. Thus, even if an extreme event transcends geographical borders, the handling of this event is tied to organizations whose responsibility concerns a particular geographical area. Thus, even if a region’s ontological status is debatable (Debarbieux 2012), regulation is always connected to specific spatial scales.

Within any country there exist different regulatory regimes: **domestic regulations vary considerably** from one domain to another (Hood, Rothstein, and Baldwin 2001). Some areas are dominated by “cost-benefit analysis culture” where costs of additional safety measures are weighed against probable benefits using explicit value-of-life calculations. Other areas are dominated by “quantitative risk assessment culture” where the risks are measured in terms of costs, but not the costs of various types of regulation and safety measures. Thus, a given state may regulate areas differently.

There are, however, **nation-specific ways to regulate risks.** As the case of biotechnology regulation illustrates: for example the US, the UK and Germany have substantially different ways of handling and regulating this issue (Jasanoff 2005). The reason for this is that there are different nation-specific **civic epistemologies;** testing and accounting for policy-relevant scientific claims vary substantially across countries and contexts. What may seem to be “similar” countries therefore diverge, because there is no linear passage from technical assessment via the public sphere to policy choice. Similarly, Perrow (2011) sees culture as a revolving door between those issuing
regulations and those that have to follow them. According to him, complex systems (such as nuclear power) that are privately run tend to lead to stronger regulatory capture than those that are state-owned.

Differences between nation-specific regulations are not necessarily linked to quality but to regulatory style. Bijker (2007) explains why a hurricane like Katrina would not cause an extreme event in Netherlands. Both the US and the Netherlands have had numerous natural disasters (such as flood, surge, and hurricane). However the role these natural disasters have played in shaping coastal engineering practice is strikingly different. The Netherlands’ historical experience of storm surge disasters in 1953 (“De Ramp”) led to a cultural trauma that guided both the public perception and the regulatory way of dealing with risks of flooding. The result is ambitious regulatory work for “keeping the water out”. In the US, the focus is on predicting disasters and minimizing their consequences once they have occurred. The difference in regulation is partly explained by geographical factors (a large part of the Netherlands territory is below sea level) and partly by political culture (the role of the state), technological culture (the role of technology) and civic culture (the active engagement of civil society). Thus, regulation is shaped by dynamic interplay by factors of the historical, social, and spatial kind.

The context for regulation is not only at a nation-state level, but may also concern particular regions. As such regional differences in regulation may exist. Political culture, civic epistemologies and technological culture may be broadly shared within a region, meaning that there may be similarities between countries in how regulation is shaped. Culture and ways of organizing society may be shared by countries, sometimes due to geographical proximity, other times between countries that are geographically separated.

Also, there are regional regulatory organizations, i.e. organizations with regional mandates, such as the European Union, the Association of Southeast Asian Nations (ASEAN), or the regional commissions under the UN’s Economic and Social Council. These and other regional organizations have an increasingly important role in global environmental governance (Balsiger and VanDeveer 2012; Selin 2012). Also, there is a multitude of bilateral and multilateral agreements, which are of a regional character, i.e. regarding shared geographical borders or governance of a transnational area (Balsiger, Prys, and Steinhoff 2012).

An extreme event, or the work to prevent its occurrence, may construct a specific spatial ontology and also establish organizations with the aim to regulate activities within a specific spatial area. The Baltic Sea is an example of an invented region, based on certain geographical, political and economic characteristics (Lidskog and Elander 2012). Being highly vulnerable to pollution (like other regional seas, such as the Mediterranean Sea and Black Sea), states and environmental organizations struggle to protect it from emissions (not least oil spills). With the exception of its Russian waters, the Baltic Sea was designated as a Particularly Sensitive Sea Area (PSSA) by the International Maritime Organization (IMO) in 2005 (Uggl 2007). Thus, the Baltic Sea has been constructed as a transnational area in need of regulation.

Some disasters are caused by certain kinds of systems (Perrow 1984). If a system is characterized by complex interaction (interactions that occur in unfamiliar
sequences) and tight coupling (minimal time lag between the processes it initiates), it follows that odd failures and incidents can rapidly result in cascade effects and system accidents. Most engineered safety features (redundant components, emergency shut-offs, suppressors and so forth) are incorporated in systems to prevent incidents from making the transition to accidents. Also, preventive maintenance, operator training and so forth can partly help to avoid failures and incidents. Thus, there may be similarities in systems across regions and spatial scales.

Specific regulatory regimes and safety cultures can be spread within a sector that crosses geographical borders. Ideas, knowledge, rules and practices travel from one region to another, meaning that policy and regulation are spread around the world and reverberate around regions. For example, the Nuclear Energy Agency (NEA) and IAEA develop knowledge and norms that are distributed to all countries with nuclear operators. In that sense policies and regulations are made mobile and diffuse between regions. At the same time, these policies and regulations always need interpretation and are situated in specific contexts, involving spatial and cultural features. Thus, regulation may simultaneously have regional features and interregional similarities as well as intraregional differences.

In some contexts (but not all), traditional top-down ways of managing environmental issues are becoming increasingly obsolete as creating new forms of governance and actor coalitions is often seen as a more feasible and efficient way to handle risks (Black 2002; Vogel 2001). However, when incidents are transformed to extreme events there is a need for rapid and strong responses. In the case of Chernobyl, the work was organized almost as a military operation in combating the fire at the plant and mitigating the consequences of radioactive emissions (Read 1993). Thus, even if there are national or regional differences in regulations, in the case of emergencies these differences may have less importance in comparison with non-extreme situations.

Simultaneously, new differences may emerge when responding to extreme events where restricted regulatory guidance is available. When there is a shortage of knowledge and routines, it may be in the hands of public managers ("street-level bureaucrats") to actually shape and reshape the delivery of public measures by interpreting rules, setting priorities and allocating resources through discretionary power (Lipsky 1980). Or the delivery of measures may be directed upwards in the formal organizational structure, resulting in decisions made by individuals with greater formal authority but lower relevant competence (Weick and Sutcliffe 2001).

5. Conclusion

Regional differences may matter, but not in a deterministic or uniform way. Regulatory regimes and safety culture are always part of the context and this context has spatial features. This context also has organizational features that may exist irrespective of geographical location and geographical scale. For example, engineered safety features, operator training programs, regulatory devices and policy measures are distributed between contexts. At the same time, knowledge, regulations, and policies have to be reinterpreted and always negotiated in order to be meaningful, relevant and viable for a new context.
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AIR POLLUTION and HAZE
1. Introduction

Despite regional characteristics including geographical proximity, cultural and historical homogeneity, societal interaction, and economic interdependence that may facilitate a high level of regional integration, attempts to institutionalize regional cooperation have not been effective in Northeast Asia because of a strong emphasis on sovereignty and mutual distrust among countries in the region. Meanwhile, institutional development of the current environmental cooperative efforts, including financial arrangements, joint project implementation, and the establishment of a secretariat, is a remarkable development in Northeast Asian regionalism.

Environmental cooperation in the region is conducted through non-binding agreements. While the agreements entail reciprocal promises or actions for implementation on the part of the individual parties, none of them contains formal clauses that describe the parties’ commitments as binding obligations or legal sanctions for non-compliance. Consequently, the interpretation and implementation of the agreements are largely up to the governments of the member countries and their practices are not subject to formal scrutiny under the agreements. Environmental cooperation in Northeast Asia shows contrasting features to the European experience, which represents a highly legislative cooperation established through a series of legally binding protocols.\(^1\) Hence, the Northeast Asian case offers an example of minimal legislative enactment and arguably exemplifies a trend against legislation in regional environmental cooperation. It seems that the countries in the region accept non-binding cooperation as a means to achieve their policy goals of safeguarding sovereign environmental decision-making while at the same time coping with regional environmental problems. The countries emphasize actual projects based on environmental cooperation. In fact, the non-binding nature of the current environmental framework gives the member countries flexibility in determining the limits and scope of cooperation.

Pursuing non-binding cooperation positively affects regional peace and stability since it avoids imposing any constraints on state sovereignty accompanying the conclusion of legally binding international agreements. Given the emphasis on the sovereignty of

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\(^1\) To address acid rain, European countries concluded the Convention on Long-Range Transboundary Air Pollution (CLRTAP) in 1979 and a series of protocols. For pollution in the Mediterranean Sea, the Barcelona Convention was concluded in 1975, followed by the Protocols on Marine Dumping and Emergency Oil Pollution (1975), the Protocol Concerning Mediterranean Specially Protected Areas, and the Athens Protocol on Land-Based Pollution Sources (1980). The Baltic Sea and the North Sea have been protected by the Oslo Convention (1972), the Paris Convention (1974), and the Helsinki Conventions (1980 and 1990). The Oslo and Paris Conventions were replaced by the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) in 1992.
2. Environmental Cooperation in Northeast Asia: Progress to Date

Northeast Asia consists of an eco-community defined by geographical proximity and seasonal weather patterns that make domestic pollution within one state easily transferable to neighboring states, thereby causing transboundary environmental problems. Acid rain, marine pollution, and yellow sand and dust storms are all transboundary pollution issues in Northeast Asia that are critical topics in regional environmental negotiations. More recent topics including climate change and marine resource depletion are also considered to be best tackled through regional policy coordination. Various cooperation channels have developed since the early 1990s in order to deal with regional transboundary pollution.

**NEASPEC**

As the first intergovernmental meeting, the Northeast Asia Sub-regional Programme of Environmental Cooperation (NEASPEC) was launched in 1993 by the Korean Ministry of Foreign Affairs and the United Nations Economic and Social Commission of Asia and the Pacific (UNESCAP) in collaboration with UNDP, UNEP, and ADB. China, Japan, South Korea, Mongolia, and Russia participated while North Korea did not join. The NEASPEC’s governing body, the Meeting of Senior Officials on Environmental Cooperation in Northeast Asia (SOMECNEA), convenes annually and makes all policy decisions concerning substantive and financial matters related to the Programme. Countries identified five priority areas for cooperation, and UNESCAP acts as the secretariat of the NEASPEC.

The NEASPEC has made considerable progress during the past decade concluding the Framework adopted in 1996, the Vision Statement for Environmental Cooperation in North-East Asia, and the Core Fund based on voluntary contributions of the member countries concluded in 2000. The NEASPEC has conducted projects for the emission reductions from improvements to coal-fired power plants in the region with targets and a timeframe (UNESCAP 2005). Training centers and technical assistance projects have been developed with ADB financial support.

**NOWPAP**

The Northwest Pacific Action Plan (NOWPAP) was launched in 1994 under the auspices of the UNEP’s Regional Seas Programme, for the preservation of the two regional seas, the Yellow Sea and the East Sea (Sea of Japan). China, Japan, South Korea, and Russia are the participants. Information management, a survey of national environmental legislation and policies, a regional pollution monitoring program, and cooperation in marine pollution emergency preparedness and response were identified as priority areas for cooperation.

NOWPAP has achieved significant

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2 For the Core Fund, South Korea made a US $200,000 contribution, and Japan and China contributed US $170,000 and US $50,000, respectively. As of the time of this writing, Russia and Mongolia have not pledged to make contributions.
institutional development. The NOWPAP Trust Fund was formed in 1997 to finance cooperative projects, and the Joint Regional Coordination Unit (RCU, the secretariat) was established in 2004. Four Regional Activity Centers (RACs) were established, one in each member country, in order to share the responsibility of monitoring and assessing marine pollution in the region. The most important institutional development under NOWPAP was the signing of the Memorandum of Understanding (MOU) on Regional Cooperation on Preparedness and Response to Oil Spills in the Marine Environment of the Northwest Pacific Region and the related Regional Oil Spill Contingency Plan (RCP) for the NOWPAP, which was presented at the ninth Intergovernmental Meeting in 2004. The MOU and the RCP stipulate that NOWPAP member countries may request assistance from other members in case of marine incidents and that the requested members should use their best efforts to render assistance.

NOWPAP has been seeking to collaborate with other marine preservation programs in East Asia including PEMSEA and the UNDP/GEF/Yellow Sea Large Marine Ecosystem Project.

**TEMM**

The annual Tripartite Environment Ministers Meeting (TEMM) among South Korea, China, and Japan was established in 1999 to further promote environmental cooperation in Northeast Asia. Identified priority areas were the strengthening of community awareness and exchange of information, preventing air pollution, protecting the marine ecosystem, and promoting cooperation in environmental industries, technology, and research. The TEMM has been expected to be similar to Europe’s Ministerial Conference for the Baltic and North Sea Preservation, which brought about a dramatic increase in regional environmental activity in that area. As a high-profile and widely publicized event that generated great public expectations, the Ministerial Conference in Europe brought to the forefront the environmental issues previously relegated to the back burner at regional forums. Operating at the highest level of the region’s cooperative framework, the TEMM receives reports from the other cooperative channels and, through the announcement of a joint communiqué at annual meetings, attempts to provide guidelines for comprehensive environmental cooperation.

In sum, environmental cooperation at the multilateral level in Northeast Asia has been well established in these standing forums for environmental negotiations. The issue of concluding a convention, let alone a protocol, has never been brought to the negotiation table. The regional countries have adopted “frameworks”, “guidelines”, “conclusions”, “joint communiqués”, and “memoranda of understanding”, which serve as useful instruments for implementing cooperation. The agreements virtually reflect a high degree of political commitment on the part of governments although they do not delineate the obligations or duties of member countries regarding monitoring, reporting emission data, and implementing reviews that would be critical to environmental cooperation that is legally binding. Neither binding

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3 The four RACs are the Special Monitoring and Coastal Environment Assessment Regional Activity Center (CEA/RAC, Japan), the Data and Information Network Regional Activity Center (DIN/RAC, China), the Marine Environmental Emergency Preparedness and Response Regional Activity Center (MER/RAC, South Korea), and the Pollution Monitoring Regional Activity Center (POM/RAC, Vladivostok, Russia).
technologies nor effluent standards are adopted. This non-binding feature of environmental cooperation in Northeast Asia is probably due to the rejection by key member countries of the legislative enactment of this cooperation (Yoon 2007).

3. Effects of Environmental Cooperation in Northeast Asia

Environmental Protection

Environmental cooperation is viewed as a workable regime to address regional transboundary pollution. The NEASEPC projects for the reduction of pollution from coal-fired power plants in China and Mongolia are expected to have positive effects in reducing air pollution. Dust storm monitoring towers are now installed in the Gobi Desert, the Loess Plateau, and Inner Mongolia, and measurement networks, which are widely dispersed throughout East Asia, are now generating valuable data to lend to the accurate prediction of hwangsa. In addition, after activating the NOWPAP regional Oil Spill Contingency Plan, the NOWPAP member countries joined hands in fighting oil spills, including the Taean Incident, the worst oil spill incident in Korean history, which occurred in December 2007. A recent survey conducted by the Korea Environment Institute of government officials and experts from regional countries shows that 87% of the respondents agreed that environmental cooperation has made progress in the past 10 years and that cooperation has affected their domestic environmental policymaking processes. Still, only 47% of respondents agreed that environmental cooperation contributes to actual improvements in environmental quality in the region.

Implications of Environmental Cooperation for Regional Politics

The institutional development of environmental cooperation has provided several mechanisms by which current cooperation may promote a genuine development for collective actions in Northeast Asia, and the collective action further provides a foundation for broader forms of peaceful regional cooperation in other issue areas. Environmental cooperation in Northeast Asia could, albeit limited, reduce uncertainty, deepen and broaden ties of interdependence, promote reciprocity, and improve the outlook for future. Joint research and exchanges of information and experts have reduced uncertainty by enhancing the understanding of the primary causes of transboundary pollution and policy interests of the member countries, as well as suggesting which measures may effectively address these issues. Such joint activities and sharing of research methods and technologies have expanded interdependence in environmental governance among countries. Environmental cooperation has also created new opportunities for expanding existing economic interdependence in the region since it links environmental technologies with markets.

Current environmental cooperation also creates ample opportunities for more diffused forms of reciprocity in regional politics. Due to insufficient experience with policy coordination at the regional level, the relationships between Northeast Asian countries have been based on a strict policy of reciprocity or “give and take” analogous to a classical barter transaction. Such narrow reciprocal bargaining is in fact fragile as it has been frequently disrupted by any abrupt changes in regional politics, which in turn results in unexpected diplomatic friction.
Through various environmental cooperative channels over multiple environmental issue areas, states become involved in complex interdependencies in the regional ecology taken as a whole, although individual states may still face the risk of becoming enmeshed in stark polluter-victim relationships and/or one-way dependencies in a specific environmental issue area.

The political implications of environmental cooperation in Northeast Asia also include institutionalized habits of dialogue among the member countries, which thus develops a shared sense of regionalism. While the Northeast Asian region has been the focus of many studies of traditional security relations and rapid economic success, the region lacks many of the economic, social, and political institutions that have made Europe and North America increasingly independent and contributed to the formation of a positive sense of regionalism. In this context, the institutional development of environmental cooperation casts a long shadow that will facilitate future regional cooperation in other issue areas.

4. Conclusion

Environmental cooperation in Northeast Asia has been driven by governments since UNCED in 1992. The regional countries adopted non-binding cooperation as the central instrument to achieve their shared policy goals to develop a collective mechanism for coping with transboundary pollution while safeguarding their sovereign environmental decision-making and economic interests. Environmental cooperation has made significant progress in institutionalizing cooperation, although it is a new arrival within the Northeast Asian politics, which has heretofore experienced an historical absence of institutionalized intergovernmental cooperation. The non-binding nature of cooperation allows the regional powers to gain greater flexibility and to achieve swift consensus in negotiations, as ratification of the agreements is not required. Non-binding cooperation also keeps environmental negotiations out of the political spotlight, thereby encouraging ongoing dialogue regardless of political developments in the region. The best evidence for this is that meetings have been held as scheduled even when overall diplomatic relationships between the members have soured over issues such as the regional security, Japan’s wartime guilt, and trade friction.

Current environmental cooperation in the region has not realized its full potential as a regional instrument for economic and political negotiation; however, it may eventually have positive spillover effect on other issues areas in the long run. Thus, recent institutional developments in environmental policy cooperation in Northeast Asia are noteworthy to show how non-binding cooperation may promote a shared sense of regionalism among states whose relationships are otherwise defined by concerns over maintaining state sovereignty, mutual distrust, and other significant rivalries.

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4 For discussions about effectiveness of formal/informal, binding/non-binding international agreements, see Lipson 1991; Abbott and Snidal 2000.
Comparing Regional Environmental Governance in East Asia and Europe – Air Pollution

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1. Introduction

This contribution is presented on behalf of the UNECE (United Nations Economic Commission for Europe) Convention on Long-Range Transboundary Air Pollution (CLRTAP), one of the most successful international instruments dealing with air pollution. The Convention was signed in 1979 as a result of scientific findings related to the “acid rain” problem, which was responsible for the decline in fish stocks, damage to forests and vegetation, and other adverse environmental effects first observed and reported by the Scandinavian scientists in the early 1970s. Careful scientific research also showed that, to the surprise of many people, the pollutants which caused this damage transported many hundreds of kilometres, indeed over the whole European continent. This led to the agreement on CLRTAP, but it also included North America – i.e. the USA and Canada – where acid rain problems were also being reported. The Convention now covers most of the Northern Hemisphere: the Russian Federation and the countries of Eastern Europe, the Caucasus and Central Asia, and Southeast Europe as well as the European Union, the USA and Canada.

The convention has given rise to a number of protocols, which have dealt with specific pollutants and problems. Protocols reducing emissions of sulphur, nitrogen oxides and volatile organic compounds were agreed in 1985, 1988 and 1991, and were followed by a second sulphur protocol in 1994. This latter protocol brought a new perspective, both politically and scientifically, in the area of international air pollution agreements. Previous protocols had contained obligations on all parties to reduce emissions by the same fixed percentage according to an indicated base year. The second sulphur protocol however used an “effects-based” approach. This relied on a sophisticated atmospheric model to model the transport of pollutants from emitting countries to the receiving areas in sensitive countries. Due to combination of the prevailing weather conditions, and the extent of emissions of pollutants in different countries, the “blame” for the adverse impacts is not uniform and could be allocated to the source regions most responsible, so that emission reduction targets would focus on these areas. The atmospheric modeling was complemented by the so-called integrated assessment model, which contained a database of technologies and costs and used a linear programming approach in conjunction with the atmospheric model to determine the least expensive strategies for a given environmental target. At that time, it was not only challenging scientifically but its acceptance at political level was also not straightforward. However, the approach clearly embodies a high degree of “environmental justice” and equity and it is now a well-accepted approach for international air pollution problems.

Subsequent protocols have extended the scientific coverage of the convention and
have dealt with heavy metals (mercury, cadmium and lead) and persistent organic pollutants – toxic compounds such as a number of pesticides, which persist for a long time in the environment and can hence be transported over large distances, in many cases around the globe. The most recent protocol to be agreed was the “Gothenburg”, or “Multi-Pollutant, Multi-Effect” Protocol in 1999 which extended the second sulphur protocol to incorporate the four main pollutants responsible for acidification, eutrophication (an excess of nutrients in an ecosystem) and ground level ozone. The Regional Air Pollution Information and Simulation (RAINS) model was developed and used by the International Institute for Applied Systems Analysis (IIASA) to support the negotiation of the protocol.

Later further developments were introduced to identify the most viable and cost-effective methods of jointly reducing emissions of air pollution and greenhouse gases. IIASA released the GAINS (the Greenhouse Gas and Air Pollution Interactions and Synergies) model, which relies on information from RAINS databases as well as updated national data delivered by countries taking part in the modeling exercise. A specific version of the GAINS model was further developed by experts from India and China in order to release the GAINS-Asia tool (see part 3).

In 2012, CLRTAP agreed amendments to the Gothenburg Protocol to include commitments to reduce emissions of particulate matter, considered to be the most important air pollutant affecting human health. The amendments also included further reductions in the four pollutants in the original protocol (sulphur, nitrogen oxides, volatile organic compounds and ammonia), which was not an inconsiderable achievement given the current economic situation.

The amendments to the Gothenburg protocol also recognized the role of some important air pollutants in climate change, notably black carbon and ozone, and made recommendations for their reduction, becoming the first international legal instrument to attempt to bridge the gap between air pollution and climate change and to attempt to maximize the co-benefits to be obtained from policies which address both issues.

Politically the amendments to both Gothenburg and Heavy Metals Protocols were so significant that the negotiations included non-parties to the protocols. Strictly speaking, only parties to the protocols have to agree on the amendments. However as will be discussed below, a strategic goal of CLRTAP is to maximize the ratifications within the UNECE region, consequently in order to facilitate this, non-parties’ interests were also part of the discussions on amendments.

2. The Long-Term Strategy of CLRTAP and Regional Cooperation

In 2010, the executive body of CLRTAP (equivalent to the “Conference of Parties” or “COP”) agreed on a long-term strategy to guide the work of the convention over the coming years. There are several elements to this strategy, which were relevant to the present workshop. First and the most obvious is the issue of outreach to areas and regions beyond the UNECE/CLRTAP region.

Science is an integral part of CLRTAP – indeed the very first protocol, agreed in 1984, dealt with the science base of CLRTAP (namely, the Co-operative Programme for the Monitoring and Evaluation of the Long Range Transmission of Air Pollutants in Europe – EMEP). It was science that led to the foundation of the convention in the first place and science
has remained at the heart of the convention’s work ever since. As discussed below, science can play an important role in regional cooperation, beyond the countries’ formal involvement with CLRTAP.

There is now a growing recognition of the importance of the transport of air pollutants over much longer distances than hitherto had been recognized. Hemispheric and intercontinental transport of air pollutants, especially ozone and particulate matter (PM), has been accepted as an important factor for the air quality management. Addressing these issues will potentially involve further outreach activities and cooperation with other organizations around the world. CLRTAP already engages with many scientists in East Asia through the Task Force on Hemispheric Transport of Air Pollution. However, the scientific activities of CLRTAP extend far beyond this particular area and further scientific engagement with East Asia on other subjects could prove mutually beneficial. CLRTAP has a long history of using science to inform policy and the CLRTAP model could be a reference for other regions to manage air pollution problems.

However, regional cooperation could potentially extend beyond the pure scientific field. It has recently become apparent that wider cooperation on air pollution problems can extend beyond the UNECE region. The convention has a worldwide reputation as one of the most successful environmental instruments and is seen as an example across the world. Building on this reputation, the convention has extended its outreach activities across the world, building on and cooperating with the work of the United Nations Environmental Program (UNEP) and the Global Atmospheric Pollution Forum, among other activities. While such cooperation has been very effective in scientific field, it should gain momentum in moving into the policy arena in the future. The long-term strategy of CLRTAP considers that these outreach activities are likely to assume even greater importance for the convention in the coming years.

Some contacts were established by the CLRTAP Secretariat with the Subregional Office for East and North-East Asia of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) and its North-East Asian Subregional Programme for Environmental Cooperation (NEASPEC). Information was delivered about a one-year project being carried out by the Russian Federation within the NEASPEC framework aimed to study existing subregional and international mechanisms on transboundary air pollution, to identify gaps between knowledge and priority needs, and to propose a set of options for a strengthened multilateral approach.

During a recent expert meeting (Saint Petersburg, Russian Federation, July 2012), the Russian Federation announced that a project proposal was forthcoming that, among others, would look into policy aspects of transboundary air pollution. It was expected that the developments in Northeast Asia might lead to the establishment of a policy-type umbrella framework that would cover the existing monitoring and modeling programs like the Joint Research Project on Long-Range Transboundary Air Pollutants and the Acid Deposition Monitoring Network in East Asia (EANET).

The Working Group on Strategies and Review under UNECE/CLRTAP took note of the information provided by the Secretariat regarding cooperation with UNESCAP and welcomed developments
conducive to furthering cooperation with Northeast Asia in addressing transboundary air pollution.

The long-term strategy for CLRTAP further notes that “The Convention will identify appropriate ways and means to best build on this work and to develop it, and to continue to build on the reputation of the Convention as a global leader in regional air pollution management,” (UNECE 2010: 5) and the present workshop in Kyoto represented an excellent forum to encourage that cooperation.

3. GAINS-Asia: A Tool for Environmental Decision-Making

The Greenhouse Gas and Air Pollution Interactions and Synergies (GAINS) model addresses local health impacts associated with fine particulate matter and ozone, vegetation damage to natural ecosystems and agricultural crops, and greenhouse gas emissions. GAINS has a medium-term planning horizon (up to 2030) and considers more than 1,500 concrete options for reducing air pollution emissions of PM, SO2, NOx, NH3 and VOCs and 200 options for reducing CO2, CH4 and N2O. It takes full account of the interaction between these measures, and assesses their local application potential and costs. It covers all 30 provinces in China and all 15 states in India.

IIASA’s Asian partner institutions in the GAINS-Asia project are the Chinese Energy Research Institute (ERI) and The Energy and Resources Institute (TERI) of India. The project is funded by the European Commission.

According to estimations made in the course of GAINS-Asia assessment, application of advanced emission control technologies could reduce health impacts in China by 43% in 2030. When used in optimization mode, GAINS was also able to identify the most cost-effective portfolio of measures to achieve these health improvements but at 20% of the costs.

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Reverberating beyond the Region in Addressing Air Pollution in Northeast Asia

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1. Introduction

Regional environmental governance has been a locus of multilateral governance as geographical proximity, climatic contiguity and ecological interconnections among members of a region clearly represent many aspects of ecological interdependence, which could be a source of “common fate” or “mutual vulnerability” among the members (Soroos 1997: 266-267). Deterioration of common pool resources (e.g. high seas and the atmosphere) and shared environmental resources (e.g. international rivers) drive the concerned countries into becoming members of a destined ecological community. In turn, natural linkages existing in ecosystems that have boundaries within and across the sub-national, national, and regional levels create concrete grounds for joint actions. As a result, globally, about 64% of multilateral environmental agreements are categorized as regional in terms of their geographical scope (UNEP 2001: 2).

However, Northeast Asia has hardly embraced the global trend of charting regional treaties or agreements that stipulate national compliance of agreed principles and rules. Instead, most mechanisms are rather informal in terms of their institutional arrangements and are mostly limited to information sharing and capacity building. This condition is not exceptional for the regional governance of transboundary air pollution. Northeast Asian countries have participated in different mechanisms, both small (Northeast Asia) and large (East Asia comprising both Northeast Asia and Southeast Asia), for jointly addressing air pollution. Throughout such processes, Northeast Asia has gradually expanded the foundation for building consensual knowledge and political commitments.

In the course of atmospheric governance, there is a growing recognition for the need to reverberate beyond Northeast Asia. This need comes into two contexts: (1) harnessing benefits of knowledge and experiences from other regions, in particular, Europe, to strengthen consensual knowledge on the regional state of air pollution; and (2) identifying its linkages with newly emerging issues such as the hemispheric transport of emerging air pollutions, including short-lived climate forcers (SLCFs).

The organization of the paper is as follows: It first reviews the progress and limitations of atmospheric governance in Northeast Asia by delving into the implications of a key contributive factor, i.e. consensual scientific knowledge, for creating and advancing an environmental governance regime.

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1 The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the UN.
Consensual knowledge alone is certainly not enough to create the necessary momentum to galvanize commitments from the member states. But without it, political will alone cannot establish an effective environmental governance regime that can overcome the fundamental disparities among different countries’ perspectives and address the complexities of an environmental issue.

The paper then looks at the potential areas and approaches for reverberating beyond the region. The endogenous need to strengthen its internal epistemic community – especially regarding monitoring and modeling – necessitates learning from other regions’ experiences and knowledge. Exogenous needs such as new issues and problems emerging also require reverberating and collaborating with other regional counterparts. Furthermore, endogenous needs also have exogenous dimensions because of the global environmental implications of forms of air pollution from Northeast Asia. In this regard, this paper identifies formulating ways for Northeast Asia to contribute to resolving emerging global issues such as SLCFs and climate change.

2. Atmospheric Governance in Northeast Asia

2.1. Overview of Governance Mechanisms

Concerning transboundary air pollution, Northeast Asian countries have collaborated through two formal mechanisms, the Acid Deposition Monitoring Network in East Asia (EANET) and the Long-range Transboundary Pollution (LTP) Project. EANET came into existence after a series of expert meetings since 1993 and then the first Intergovernmental Meeting of 1998. The geographical scope covers 54 deposition monitoring sites in 13 countries of both Northeast and Southeast Asia. As the name explicitly defines, the primary target of EANET is acid deposition; the objective being the prevention or reduction of its adverse impacts through creating a common understanding of the problems, providing useful inputs for decision-making and facilitating international cooperation on related issues. In order to achieve this objective, EANET has developed guidelines, technical manuals, and quality assurance and quality control (QA/QC) programs for the harmonization of monitoring methods and collection of accurate data. While EANET monitoring mainly targets acidifying substances, it has also expanded to include other chemical species such as ozone and particulate matters (PM). However, unlike the reporting of acidifying substances, reporting on the monitoring results of chemical species is done by only a limited number of countries.

In terms of institutional arrangements, EANET has gained a stronger political ground in 2012. Its official launching as an intergovernmental program was not underpinned by any formal agreement but by the “Joint Announcement on the Implementation of EANET” that was adopted at the Second Intergovernmental Meeting in 2000. Subsequently, EANET had a series of negotiations and adopted a formal agreement called “Instrument for Strengthening EANET” in 2010 and it came into effect in January 2012.

Compared to EANET, LTP could be viewed

\[2\] Cambodia, China, Indonesia, Japan, Lao PDR, Malaysia, Mongolia, Myanmar, Philippines, South Korea, the Russian Federation, Thailand, and Vietnam.

\[3\] Currently, Japan, South Korea, the Russian Federation, and Thailand report on ozone and China, Japan, South Korea, and Thailand report on PM, to the Network Center.
as a sub-program owing to its small geographical scope that covers only China, Japan, and South Korea, and its weak institutional basis lacks any intergovernmental agreement. However, LTP has significant potential in strengthening atmospheric governance beyond Northeast Asia. The potential is embedded in different aspects: first, the huge scale of forms of air pollution generated from Northeast Asia, which accounts for one-fourth of SO2 emissions and one-third of CO2 emissions in the world; second, the flexible arrangement of program planning through the Joint Research Proposal, which provides room for LTP to expand its scope of targeted pollutants – for example to heavy metals and persistent organic pollutants (POPs). Despite such potential, LTP has rarely been a subject for scholarly discussions on atmospheric governance in Northeast Asia. This is due to its low visibility and limited access to its information for outsiders. Given such potential of LTP to expand and advance its scope, this chapter will mainly focus on the assessment of LTP in order to present the implications for atmospheric governance in the region.

2.2. Background and Achievements of LTP

LTP was launched in 1999 after roughly a four-year-long preliminary stage. During this stage, intentions and objectives for establishing LTP were shared through workshops, expert meetings, working group meetings, and research proposals. When LTP was launched in August 1999, monitoring parameters, modeling details, and two sub-working groups had already been determined. As for the involved stakeholders, LTP was initiated by the Ministry of Environment of the Republic of Korea, and the Secretariat role was assigned to a Korean government-run research institute, the National Institute of Environmental Research (NIER).

The first stage, spanning from 2000 to 2004, concentrated on building an international cooperation platform and formally agreeing on the monitoring parameters and methodologies. A database on atmospheric pollution concentration and emission was also established, along with the enhancement of estimation techniques and introduction of source-receptor relationship (SRR) analysis. During the second stage, from 2005 to 2007, monitoring data were analyzed, LTP emission inventories were developed, and transport of sulfur was modeled. As most of these respective activities carried on, the scope of monitoring parameters, geographical domain and methodologies continued to expand. Finally, during the most recent third stage, from 2008 to 2012, the preceding activities continued while modeling activities were improved through model inter-comparison. Also, future emission scenarios have been drawn up, along with the development of a vulnerability map through soil ecological impact assessment.

Despite such expansion in coverage and activities, many aspects are still lacking. In terms of model inter-comparison, full model output and detailed process dynamics have not yet been performed except for SRR modeling. Furthermore, while essential items under monitoring parameters have good coverage, optional items, such as recommended monitoring targets, are poorly covered (SWG 2012: 135-147).

3. Consensual Knowledge, Atmospheric Governance and LTP

Building atmospheric governance requires an apparent basis of consensual knowledge to shape state actors’
perception of an environmental problem and to work towards internationally coordinated actions. The domain of consensual knowledge includes not only the scientific aspects of a given issue, but also the social and economic consequences of the issue and the implications of associated policy measures. In particular, past experiences of regional conventions on transboundary air pollution in Europe and North America show that scientific consensus on ecological, social and economic impacts of air pollution on source and adjacent countries is critical for overcoming the political impediments to establishing regional programs (Levy 1993: 76). Scientific knowledge had also been the key to promoting the formation and growth of the Convention on Long-range Transboundary Air Pollution (CLRTAP). Not only did CLRTAP greatly benefit during its startup phase from the monitoring program that had been started by the Organisation for Economic Co-operation and Development (OECD) in 1972 all around Europe, but the upgrading of CLRTAP to the incorporate critical load approach also benefited from the European Monitoring and Evaluation Programme (EMEP) monitoring and the Regional Air Pollution Information and Simulation (RAINS) model of the International Institute for Applied Systems Analysis (IIASA) (Lidskog and Sundqvist 2002: 88, 92).

Even before that, Europe accumulated experience of joint research on the impact of long-distance transport of air pollution through initiating a large-scale, long-term project in the mid-1940s that would later become the European Air Chemistry Network (Clark et al. 2001: 30). In addition, experience of policy coordination on sulfur content of liquid fuels under the European Commission Environmental Action Programme in the mid-1970s (Huber and Liberatore 2001: 296) contributed to successful formation and nurturing of CLRTAP. All of this existing experience and knowledge allowed CLRTAP to come into shape and implement impact assessment – subsequently the concept of critical loads. This advanced scientific approach, particularly the critical loads approach, readily translated into policy. It brought the work of the CLRTAP regime to a new era, namely the signing of the Protocol on Further Reduction of Sulphur Emissions. This upgrading created a more advanced regime that expanded its pollutant scope to several compounds and led to more accountable modeling standards that incorporated many effects and varying national reductions (Lidskog and Sundqvist 2002: 90).

Unlike Europe, however, Northeast Asia was only able to start joint research on transboundary air pollution from the mid-1990s due to the complete vacuum of multilateralism during the Cold War era. As a result, modeling and monitoring of long-range transport of air pollution have serious limitations in terms of their history and scope, and thereby still face difficulties in building consensual knowledge on the causality of emissions and their impact.

3.1. Emission Modeling Scenarios

Modeling has been the major area of joint work under LTP. Introduction of SRR analysis in the first stage, followed by attempts to implement model inter-comparison, impact assessment, and future emissions scenarios have been active areas for building consensual knowledge. The main tool for SRR analysis was developed by each of the three countries via their own numerical models to calculate SRR for sulfur and nitrogen,
while simulation work followed a jointly agreed guideline (Chang 2012).

For SRR analysis, LTP divides the three countries into five separate regions: Northern, Central, and Southern China, South Korea, and Japan as shown in Figure 1. In the 2011 Annual Report, the Chinese group provided the total N deposition (sum of dry and wet deposition of NOx, nitrate, HNO3, and PAN) as average values for the 12 months of 2006. The results showed that Region II makes significant contribution to other regions: it accounts for 62.0% of the total N deposition in Region I, 37.2% in Region IV, 33.5% in Region III, and 19.5% in Region V.

Figure 1: Five source-receptor regions (Region I, Northern China (>40°N); Region II, Central China (30-40°N); Region III, Southern China (<30°N); Region IV, South Korea; and Region V, Japan)

In the 2012 Annual Report, the three countries again analyzed SRR with data from 2006, for the months of February, May, June, and November. Figure 2 shows the average values for each of the three countries’ own analyses, revealing slight discrepancies among the three countries’ modeled values. The discrepancies arise due to the complicated nature of transboundary air pollution modeling.
Figure 2: Relative contribution from sources to receptors for total nitrate dry and wet deposition (average values during February, May, June, and November of 2006)4

4 All tables and figures are the authors’ own, created using data from the Secretariat of Working Group for the LTP Project (SWG 2012).
However, the value disparity among the countries has in fact narrowed compared to the past. Modeling simulations of long-range transport of air pollution emerged while political tension over any discussions on transboundary air pollution clearly existed. During the 1990s, Chinese and non-Chinese scientists presented very different understandings of the regional impacts of sulfur emission from China. Chinese experts estimated that China accounts for only 3.5% of Japan’s total sulfur deposition (Huang et al. 1995: 1925). In contrast, Japanese experts concluded that China is responsible for one-half of the anthropogenic wet sulfur deposition (Ichikawa and Fujita 1995: 1931). Although Chinese research included both dry and wet sulfur deposition, and the Japanese research focused on wet deposition only, the results present a significant gap. Japanese scholars and international collaborative research also found that wet sulfate deposition accounted for 60-70% of total deposition in Japan (Carmichael and Arndt 1997: 7). This finding gave a value disparity between the two outcomes of roughly ten times. While this problem resulted from employing different models and methodologies, experts outside the two countries recognized this disparity as a symbolic gap among Northeast Asian experts’ understanding and the hurdles in building consensual knowledge on regional air pollution issues (Shim 2000: 23; Carmichael et al. 1999: 2).

This gap has become much narrower in the 2000s, as seen in Table 1. In a number of cases, the Chinese impact on other countries is stated as higher than what is found by the receptor countries. Such findings may implicate subdued political tension with higher regards for objective scientific approaches.

### Table 1: Relative Contributions in Percentage for Total Nitrate Dry and Wet Deposition from China (Region I, II, III) to Korea and Japan

<table>
<thead>
<tr>
<th>From China (Rg. I, II, III) to Korea (Rg. IV)</th>
<th>From China (Rg. I, II, III) to Japan (Rg. V)</th>
</tr>
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<tbody>
<tr>
<td>Feb</td>
<td>May</td>
</tr>
<tr>
<td>Korean study</td>
<td>79</td>
</tr>
<tr>
<td>Japanese study</td>
<td>54</td>
</tr>
<tr>
<td>Chinese study</td>
<td>58</td>
</tr>
</tbody>
</table>

Meanwhile, disparities exist not only in the studies conducted by different countries, but also between estimated values and sampled values as demonstrated in Figure 3 (SWG 2012: 170). These gaps again highlight the need to mend the current scientific shortcomings in failing to account for various factors such as different chemical properties of various pollutants and effects of the local environment. Seasonal variations, microclimatic conditions, nonlinear chemical reactions and photochemical reactions are also pending subjects to be accounted for in order to achieve more accurate modeling (SWG 2012: 240). In order to enhance such scientific accuracy, participation of wider groups of scientists also needs to be assured.
Similarly, studies carried out under the Model Inter-comparison Study in Asia (MICS-Asia) also experienced similar gaps and differences. MICS-Asia, with the general objective of building a common understanding of model performance and uncertainties in Asia, carries out major activities consisting of inter-comparison of multi-scale models, building emission inventories, and bridging air quality and climate change together in view of model inter-comparison. Model inter-comparison studies are dedicated to minimizing the inevitable uncertainties in the results of numerical models associated with, inter alia, emission inventories, boundary conditions, meteorological data, and physical and chemical processes. They are also dedicated to curtailing the discord in parameter setting and module selection that renders large variability in the results (Sato 2012).

Despite such difficulties in eliminating sources of error and obtaining higher accuracy, MICS-Asia demonstrates how modeling can be a useful exercise and tool for expanding activities and their relevance. For example, Phase III of MICS-Asia endeavors to seek a co-benefit approach that simultaneously addresses the issues of air pollution and climate change. Towards this end, multi-model estimation of the emission and deposition of SLCFs has been one of the key activities for establishing the bridge between air quality and climate change (EuMetChem 2012). Via rigorous scientific modeling that covers a wide range of target pollutants, the issues that can be addressed by a regime can also be expanded.

3.2. Monitoring the Influx of Long-range Transboundary Air Pollutants

In addition to modeling, monitoring is another key component of LTP, as solid observational data is required to build and validate the reliability of modeling data, in particular, with regards to the flux of long-range transboundary air pollutants. Each participating country has set up two monitoring sites and produced monitoring data for comparison and analysis as specified in the Terms of Reference for Joint Research on LTP. Quality assurance and quality control (QA/QC) programs on empirical results with calculated values are also undertaken in the LTP activities of China, Japan, and South Korea according to the guidelines and rules jointly established by participating institutions (Chang 2012). Since the four years of the

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5 The monitoring sites of each country include Dalian and Xiamen in China, Oki and Rishiri in Japan, and Ganghwa and Gosan in South Korea.
preliminary stage, during which there was deliberation on the details about monitoring targets, locations, methodologies, etc., monitoring activities under LTP have been consistently expanding in terms of the parameters measured and the methodologies utilized.

Although such means have been deliberated on and implemented under a collaborative effort, several areas for improvement have been identified. First, utilization of the most recent data continues to be a task that has yet to be fulfilled. China has been slow to upgrade its emissions data and thus model simulations use 2006 emissions data (Shim 2010: 9). Annual emission inventories from each country would help researchers discard outdated data and utilize the most recently updated data. Second, in order to enhance the research activities of LTP, the Proposal for the Future Development of the LTP Project presented at the 2012 meeting states that data sharing through both monitoring and modeling shall be expanded. The current and continuously monitoring stations need to be expanded to urban and suburban stations, increasing the number from two to four per country. At the same time, O₃, PM₂.₅, heavy metals, VOCs, and POPs are expected to be added to the current list of monitored items of SO₂, NO₂, CO, PM₁₀. In another aspect, intensive monitoring, which is carried out twice a year, suffers from limitations in monitoring items and monitoring period, as well as from the absence of inter-comparison observations. The recommendation by experts calls for joint monitoring at designated stations and changing the monitoring period from ten days in each spring and fall of every year to 30 days each every two to three years. Such changes in monitoring procedures and parameters are recommended in order to provide more complete data.

3.3. Implications for Institutional and Programmatic Development of LTP

LTP has also been impacted highly by its various institutional and programmatic characteristics. This section briefly describes three different aspects that have largely hindered full-fledged growth of the epistemic community of LTP and of the organization in general as an effective regional environmental governance regime.

**National interests:** The first and the foremost challenge for LTP in its institutional setting is the lack of political status that can formalize the outcomes of the project into intergovernmental actions. LTP is officially recognized as a project at the level of research institutes, not at the level of government (Nam 2002: 163). Disparity and conflict among national interests also pose obstacles to LTP gaining more authoritative institutional status. Between Japan and South Korea, there are clearly different embedded interests in EANET and LTP due to different levels of ownership over each program from their inception (Woo 2010: 19). As the largest source of air pollution in the region, China has been traditionally defensive and reluctant to commit, especially considering that a commitment indicates a cost and a suppressor to its economic development. But China has gradually become active in multilateral environmental initiatives, motivated by the threats of health and environmental deterioration to the sustainability of its economic growth, as well as by seeking opportunities in the initiatives to strengthen its own capacity (Komori 2010: 8-9).

**Policy linkage:** The lack of structural links to bridge scientific findings to policymaking also hinders institutional
growth. LTP does not organize task forces to perform central compilation of monitoring and model data; instead, national reports are written annually and compiled at the end of each phase to produce a regional report. This not only hinders effective collaboration to devise a fully integrated report, but it also obstructs translation of scientific knowledge into policy. In response to this challenge, the Proposal for the Future Development of the LTP Project suggests forming a Science Advisory Committee that consists of authoritative experts from the three countries that would be in charge of publishing a comprehensive report for policymakers by integrating and analyzing reports by each country.

Limited participation of the academic community: In LTP, the number of participating experts remains relatively low, highlighting the need for a stronger epistemic community to help depoliticize issues among countries. International collaboration to share information and to make common policies does not necessarily imply finger-pointing and taking on burdens. For instance, the SRR analysis identified that about 5-10% of the pollutants originated outside the LTP domain in the month of February. In addition, it was found that most of the nitrate for Region III (Southern China) was found to be originating within the region itself for the months of February and November. As such, more accurate scientific findings not only eliminate potential conflict of interest among countries, but also provide the possibility to depoliticize environmental issues by identifying the potential benefits to each stakeholder.

Multiple suggestions have already been made for strengthening the epistemic community of LTP: using satellite technology to monitor the atmosphere over ocean surfaces, collecting data on changes in land use as complementary to emission inventories, subdividing the current five regions for SRR analysis, and utilizing advanced analysis methods that can model the causal effects in atmospheric pollution. These measures can establish a firm foundation for instigating the engagement of official-level stakeholders, which will help translate the scientific activities and results into policies. At the same time, encouragement of the utilization of more advanced scientific methods is expected to induce more avid participation from academics that are motivated by the employment of advanced scientific methods (Woo 2010: 20).

4. Reverberating beyond the Region

4.1. Linking with the Scientific Community beyond the Region

There is a converging view on the need for atmospheric governance in Northeast Asia to take the multi-pollutant, multi-effect approach, and to improve the current settings of modeling and monitoring work. Atmospheric governance can be made more flexible for engaging a wider group of scientists and utilizing publically available data (Ghim et al. 2012: 136). A study commissioned by LTP pointed out a rapid increase in the number of scientific papers on forms of air pollution in Northeast Asia. In particular, in an internationally renowned journal, *Atmospheric Environment*, papers containing the keyword “China” numbered 196 during the six years from 1994 to 1999, but this number increased to 1,751 during the five years from 2006 to 2011 (Ghim et al. 2012: 136). This simple figure highlights the rapid expansion of the scientific community involving regional air pollution.
and the significant potential in building a solid epistemic community on the subject in Northeast Asia. However, there is yet to be any effective formal mechanism to bring the outcomes of scientific research into LTP work or share them with the wider scientific community. Overcoming this missing link is crucial to narrowing existing gaps in current modeling and monitoring work. In this regard, the LTP-commissioned study has suggested assigning modeling work to the scientific community while its own expert meeting would be responsible for ensuring the adequacy of the work and reliability of the results. It also recommends opening all LTP reports to the outside community.

There is also the need for LTP to reverberate beyond Northeast Asia with regard to taking the multi-pollutant, multi-effect approach. An expert review meeting held by the Northeast Asian Subregional Programme for Environmental Cooperation (NEASPEC) in July 2012 identified the need to implement a holistic program of transboundary air pollution regulation, including control of all main pollutants, air quality monitoring and emissions data gathering, atmospheric modeling, impact assessment on health and ecosystems, and an effective emissions abatement strategy. The meeting also identified the need to strengthen the connection between research and policy, using CLRTAP and EMEP as a model; and to provide a channel for the open and effective exchange of knowledge and data among members (NEASPEC 2012). Responding to these recommendations will require the involvement of scientists from diverse disciplines and inter-regional collaboration, in particular, with European and North American regions. A NEASPEC-commissioned study pointed out that EANET has collaborated with CLRTAP on data compatibility with European/North American data (Sato 2012: 10). Such could be the way forward for LTP, especially in the context of newly emerging problems that require collaborative efforts.

4.2. Emerging Issues Compelling Inter-regional Cooperation

The rising concern surrounding SLCFs is anticipated to bring focused efforts to further reverberate beyond conventional regions of interest. Because SLCFs place traditional “air pollution” issues in the context of global climate change, local or regional problems are approached from a global perspective, thus compelling the scientists and policy makers to take a co-benefit approach that treats air pollution and climate change in an integrated way. In particular, black carbon, emitted as soot in biomass and biofuel burning, as well as fossil fuel combustion, has been recognized as a powerful SCLF requiring priority attention. Deriving from air pollutants, those conventional problems that were thought to be local problems are being uncovered to reveal that they have significant implications for global problems, such as black carbon being the second most important contributor to rising global temperature next to carbon dioxide (Ramanathan 2007: 5, 7).

In Europe, the Task Force on Hemispheric Transport of Air Pollution (TF HTAP) under CLRTAP recommended in 2010 that black carbon components of transported PM need to be better understood as they are part of the intercontinental transport of aerosols. With black carbon as one of the aerosols that are transported at long-range, the TF HTAP recommended to put particular importance on the long-range transport of black carbon for understanding climatic implications (TF HTAP 2010: 49). In this regard, CLRTAP
established the Expert Group on Black Carbon in June 2010 with a mandate to devise options for revising the 1999 Gothenburg Protocol of CLRTAP. The Expert Group has recognized that no country has a comprehensive program to measure and report the emissions and ambient concentrations of black carbon and therefore encouraged efforts toward gathering and sharing data (UNECE 2010: 2).

The issue of black carbon in Europe has already instigated inter-regional collaboration by geographically locating the potential consequences of the issue to the Arctic and identifying associated stakeholders. As the expert group raised the issue of black carbon emission from shipping in the Arctic, collaboration with the International Maritime Organization (IMO) was put forward as another recommended action. This also opened up a channel for inter-regional cooperation with Asian counterparts because of the known fact that the Arctic is heavily influenced by Asian anthropogenic emissions due to more efficient lifting of emissions into the free troposphere in Asia than in Europe (TF HTAP 2010: 160).

SLCFs and black carbon in particular are sure to be of utmost importance for Northeast Asia as well. One of the five regional hotspots of black carbon in the world is “East Asia”, which comprises eastern China, Thailand, Vietnam, and Cambodia (Ramanathan 2007: 7). In particular, black carbon emissions from China alone could be almost twice total emissions from Europe. The IIASA estimated black carbon emissions from Europe to be 0.8 million tons, while a study by experts from China Meteorological Administration on the black carbon emissions inventory in China estimated 1.5 million tons for China in 2000. The inventory study identified that a majority amounting to 54.5% was attributable to the residential sector, followed by industry (36.27%), biomass burning (6.88%), transportation (1.79%), and power (0.53%) (Cao et al. 2007: 77). The highest black carbon emission was from coal use in the residential and industrial sectors of rural areas. Another study by the University of Iowa on black carbon emissions in China and other parts of Asia found that black carbon emissions in China and other East Asian countries increased by 93.5% and 127.4%, respectively, during the six years between 2000 and 2006 (CGRER 2010). While there are methodological discrepancies in quantifying black carbon emissions, these results reveal the significance of addressing black carbon in China and East Asia.

There is, however, much work ahead. Studies at both national and regional levels in Northeast Asia are still at preliminary stage and based on existing mechanisms; LTP and EANET have not incorporated this issue into their programs yet. Thus, it is important that CLRTAP replicate its approaches to Northeast Asia. Such a shared problem is paving the way for different regions to transfer knowledge and experience with controlling new target substances that have implications beyond regional boundaries. The CLRTAP approach to creating mutual scientific consensus on black carbon can be learned and applied to Asia, in particular Northeast Asia, to help formulate multilateral collaboration on conducting research and institutionalizing appropriate measures.

5. Conclusion

Atmospheric governance in Northeast Asia is expected to move onto new approaches from 2013. After finishing the third stage
of activities in 2012, LTP looks to expand activity scope and reshape its activity approach for the fourth stage starting from 2014 after a year of consultation processes. Japan, which has driven the establishment and operation of EANET, also seeks to develop a new platform to overcome the limitation of the institutional setting of EANET. In this regard, Japanese institutions have conducted research on “Scientific Analysis of Regional Air Pollution and Promotion of Air Pollution Management in East Asia Considering Co-benefits” to identify possible options for developing and/or strengthening a regional framework (Sato 2012). As a key focus of the planned research for 2013, hemispherical long-range transport of ozone and aerosol pollution will require implementation of a new platform that will substantially widen the scope of collaboration.

In this course of reshaping atmospheric governance, strengthening the knowledge basis of governance will be a key component to promoting its formation and overcoming politically sensitive issues. In the case of LTP, its current challenge can be described as having a scientific knowledge basis that is yet to be fully integrated into a solid whole, accompanied by lukewarm political attention and institutional status. The current shortcomings of consensual knowledge may be seen as the areas in which inter-regional collaboration or consultation with other atmospheric governance mechanisms can be of great value. Collaboration can also occur among the epistemic communities. While there is an endogenous need for LTP to reverberate beyond the region, the exogenous component lies in the need to advance common understanding of the impacts of air pollution that extend far beyond the region.

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Comments

Mari Koyano
Hokkaido University

Thank you very much for your kind introduction.

It is a great honor to be able to join this extremely interesting workshop here today as a commentator. I would like to express my gratitude to Aysun and Jörg for kindly inviting me to Kyoto. I would like to make some comments on regional environmental co-operation from an institutional perspective. I am - presumably- the only lawyer among all the participants of this workshop. As an international lawyer I would like to stress the significance of institutional factors in the development of regional environmental co-operation in many respects. Moreover, I would like to take advantage of this opportunity for promoting constructive dialogue between lawyers and experts from other fields of studies for enhancing environmental co-operation in East Asia. Unfortunately, in general we have not had many success stories concerning academically constructive dialogue between lawyers and experts of international relations. Furthermore, it is often acknowledged that there is no space for lawyers to say anything constructive about transboundary regional co-operation, particularly in Northeast Asia where there is no legally binding multilateral agreement for regional environmental co-operation. However, I believe that lawyers can make an important contribution in thinking about building regional frameworks, which are after all ultimately formal arrangements, based on our views and experiences obtained from our empirical studies of existing international legal arrangements and their operations.

First, taking into account of presentations given by the speakers, I have made comparison between Europe and East or Northeast Asia from various points of view. There are some distinctive points of the state in regional environmental co-operation in Europe. On the other hand, almost all of them are missing in East Asia, particularly Northeast Asia. The most striking difference for me, as an international lawyer, concerns the existence of legal arrangements. In Europe, there exist a lot of multilateral legally binding agreements, which are complemented by a number of bilateral agreements, concerning various environmental sectors or issues, whereas there are very few such agreements in East Asia, particularly Northeast Asia. Moreover, the multilateral agreements formulate substantive obligations, procedural obligations as well. Procedural obligations should cover the lack of substantive regulation, prompt its introduction or work complementarily with it for managing transboundary environmental problems. Procedural obligations include: duties of undertaking certain procedures, such as environmental impact assessment, namely EIA, EIA in a transboundary context, i.e. TEIA, prior notification, consultation, monitoring, exchange of information, notification of emergency situations, concerning proposed activities that are likely to cause a transboundary significant adverse impact on the environment, i.e. transboundary environmentally hazardous activities, or situations that may cause, or
have caused, a significant adverse impact on the environment, namely, environmental emergency situations. Regulation based on these duties would contribute to managing transboundary environmental risk. There also exist various patterns of legal interests between relevant states under the agreements. Then, many of the agreements require contracting parties to ensure some kind of public involvement, such as provision of information, etc. Moreover, in many cases they institutionalize scientific and technological consideration.

Then, there exist external factors as the basis of adopting such legal agreements and of implementing them. Such external factors include: roles of highly institutionalized organizations, such as the European Union (EU), the United Nations Economic Commission for Europe (UNECE) and the Council of Europe and harmonization of domestic legislation. We need to pay enough attention enough to the impact of domestic institutional factors, legal or administrative, in relevant states on regional environmental cooperation. In particular, harmonization of legislation has been brought about in the EU member states in many fields. Also, it should be noted that states share common views on regional environmental problems as the basis. There exist extensive scientific activities that make it possible.

Moreover, we should not forget the external factors in the wider context. Again the existence of the EU has had huge impact on development of the legal arrangements in many senses, such as economic integration, enlargement and the EU Neighborhood Policy. Without the EU such extensive development, particularly since the 1990s, may not have been achieved. Lastly, it should be noted that there has been less military tension in Europe.

Then, what should be done for enhancing regional environmental co-operation in East or Northeast Asia? Considering the observation aforementioned, there are several questions to be answered in this context. They are as follows: should cooperation be based on legal agreements or “soft” arrangements? Should they institutionalize substantive regulation or procedural one? Should the co-operative framework be multilateral or bilateral? What kind of relations should the framework have with global framework? Should we take a comprehensive approach or an issue-by-issue approach? How should scientific or technological experts be involved in the co-operation? How should we ensure public involvement and promote institutional transparency?

Here, I would like to emphasize the usefulness of a procedural approach: namely, institutionalizing procedural regulation under legal agreements. It should cover the lack of substantive regulation based on substantive obligations, prompt the introduction of substantive regulation or work complementarily with it for managing transboundary environmental problems. In contrast, substantive obligations place a restriction on the right to decide on the matters concerned of the state of origin. They include, for example, prohibition of certain activities, restriction on emission of certain substances, mitigation of environmental harm. On the other hand, procedural obligations do not require a state that has jurisdiction or control over the activities or situations to regulate them. In other words, the right of the state of origin to authorize or undertake the proposed activities or to decide on the situations is not restricted. In this sense, procedural regulation institutionalizes “soft control” over sovereignty of states for managing environmental risk.
Such procedural regulation has recently been identified as an important tool in managing transboundary environmental risk in the international community. There are an increasing number of treaties formulating a duty to undertake the procedures. The Rio Declaration on Environment and Development, as well as the draft articles on Prevention of Transboundary Harm from Hazardous Activities, adopted by the United Nations International Law Commission in 2001, the so-called “ILC Draft Articles on Prevention of Transboundary Harm,” confirms the significance of procedural obligations. Moreover, since the 1990s in almost all of international litigation cases on environmental disputes, non-fulfillment of procedural duties by the state of origin has been the subject matter. Some writers even argue that under customary international law, states are obliged to take prior procedures, including TEIA, prior notification and prior consultation, concerning proposed activities. It is widely accepted that there exists a duty of emergency notification in customary international law that applies to all states.

Under the current situations of East or Northeast Asia, is it possible to adopt a legal agreement, either multilateral or bilateral, that formulates such procedural duties? It presumably depends on what procedure might be adopted. In any case, it should be important to achieve it, as it presents us a valuable precedent for introducing a legal arrangement in the region, which specifically formulates concrete legal obligations for environmental co-operation. It may be a start for developing a legal framework in the region. We could then - ultimately - step into the stage of institutionalizing substantive regulation, based on good practice established via procedural co-operation, in the long term.

However, considering the current situation in the region, it is quite unrealistic to expect that we can establish an operative legal framework on prior procedures in the short term. This is in marked contrast with the situation in Europe where there are many precedents like the UNECE Convention on Environmental Impact Assessment in a Transboundary Context, the so-called “Espoo Convention”. It can be valuable that the Korean Environmental Institute has continuously organized an international workshop to promote introduction of TEIA in Northeast Asia, in collaboration with the UNECE, since the early 2000s. However, there seem to be too many disincentives for introducing a procedure in the region at this stage. For example, undertaking the procedure concerning a project may have substantial impact on national development policy, since potentially affected States may oppose to the project in question based on the results of TEIA. This could affect a decision-making of the government of the state of origin substantially. Also, in Japan, for example, we need to reform basic structure of our domestic systems of EIA for implementing a duty to undertake TEIA at the national level. Considering various relevant factors, introducing such a duty is not feasible, at least for the moment.

Then, what about a duty of monitoring or exchange of information? Obviously monitoring and exchange of information is critically important for managing transboundary risk. It has been clear in the experience of Europe. We certainly need regular monitoring jointly undertaken by relevant states and of sharing information among them for establishing common views on transboundary environmental problems. In this context we should be aware of the fact that there already exist several mechanisms for monitoring at the regional level, as introduced by the presenters of the workshop. However,
their effectiveness is still unknown. Various questions remain: should we make existing mechanisms work without their fundamental reform, re-structure them or establishing new arrangements for the purpose? The role of scientific community should also be considered carefully in this context. Considering the current situation, it seems unrealistic to construct legal framework in the short term. It may be better to think about how to develop an effective “soft” arrangement and to try to discuss the possibility of establishing a legal framework based on good practice in the future.

However, it seems relatively easy to formulate a duty of emergency notification by legal agreements in East or Northeast Asia. It may be useful to utilize existing non-regional treaties. This means that states conclude regional or bilateral agreements that specify contents of the non-regional, global treaties, such as the United Nations Convention on the Law of the Sea, the so-called UNCLOS, the Convention on Nuclear Safety or the Convention on Biological Diversity. At the same time, it codifies an existing customary duty of emergency notification into a form of a treaty. It would not take substantial cost for states diplomatically or domestically, because it would not impose additional duties on states. We simply need a political decision at, and strong commitment from, the very top of the executives. Rather, such agreements would be practically useful for the states, as they would give specifically practical guidance for the states on how to comply with the duty that they have already had under existing non-regional conventions. If Japan had such agreements with neighboring states at the time of the Fukushima nuclear accident, it would not have faced much criticism against its behavior in the international community. Considering the increasing number of nuclear power plants in the Asian region, we urgently need such agreements. This should be a lesson that can be learnt from the Fukushima nuclear accident.

For the moment it may be a realistic option to conclude a bilateral treaty for the relevant states first, and, then, to extend its scope to include other relevant states. Thus, it may be a good option to start to formulate a duty of emergency notification in a legally binding bilateral agreement and to develop good practice concerning the agreement in a more elaborate legal framework, ultimately for substantive regulation, from the institutional point of view.

Finally, what do we need to enhance regional environmental co-operation in East or Northeast Asia? This may consist of several stages, including framing the region, i.e. identifying the scope of geographical coverage; identifying problems to be solved and sharing common views on the problems; analyzing various negative factors or disincentives; setting clear goals and targets; taking realistic approaches, i.e. selecting effective and practical tools, utilizing existing global or regional inter-state framework and analyzing utility and limits of legal tools; adopting effective strategies, particularly on cost coverage; and thinking about environmental co-operation in the wider context, particularly in relation with the matters in the field of economic development and security.
Concluding Notes

Aysun Uyar, Jörg Balsiger, and Makoto Taniguchi
Doshisha University, University of Geneva, and Research Institute for Humanity and Nature

Why Did We Compare European and East Asian Regional Environmental Governance?

Our initiative to organize a workshop on comparing regional environmental governance in Europe and East Asia started with a keen interest in the rising importance of regional environmental governance (REG). While environmental governance at the regional level has become a significant level of analysis and starting point for science and policy-making interactions, there remained important questions concerning how recent regional frameworks, be it an environmental regime or a regional preferential trade agreement, take the environment into consideration, and whether we can compare different structures and practices of European and East Asian REG mechanisms.

We identified three analytical questions: How recent REG mechanisms and associated actors frame their “regional” context (framing the region); how these regional mechanisms are crafted along regional particularities and issue-specific commonalities (crafting the region); and whether/how specific instances of regional environmental governance are diffused beyond their immediate context (reverberating beyond the region). These questions were substantiated by the following objectives that led us to the interdisciplinary and exploratory workshop of 24-25 January 2013 (EE-REG 2013; Balsiger 2013):

• Producing a state-of-the-art assessment of recent developments in REG in East Asia and Europe.

• Examining similarities and differences between the constructions and practices of REG in two regions.

• Raising awareness on interdisciplinary approaches to “region” and “regional” environmental governance among social and natural scientists.

• Initiating a dialogue for researchers of REG in Europe and East Asia and promoting future research collaboration.

The EE-REG workshop successfully brought together experts and those who are interested in REG along those three analytical questions and topical panels on rivers and seas, mountains, extreme climate events and air pollution and haze. During two days, around 50 participants – senior and junior researchers and practitioners – concentrated on regional environmental governance issues.

Most of the above objectives were met through deliberate workshop preparation, interactive panel management (each panel had equal representation of European and East Asian natural and social scientists), and the participants' commitment to extend our research collaboration on REG, starting with this volume of proceedings.

Based on the wrap-up panel discussions of the workshop and revised papers included in this volume, the following sections highlight the main findings on REG in East Asia and Europe.
**Framing the Region**

Initially, it was agreed and emphasized throughout the workshop that neither Europe nor East Asia could be assumed to have the most “appropriate” or “best functioning” model for REG. Both European and East Asian modalities present various strengths as well as questionable aspects and it was agreed during the workshop that regional as well as natural dynamics of each frame lead to its own specific framework. And we can learn more on each model by comparing their constructs and practices.

In terms of framing similarities between the two regions, workshop participants agreed that there are region-wide and subregional entities both in Europe and East Asia. The European Union for sure plays an important role not only within its organizational limits but also in contributing to the delineation of an identity within the region. Likewise, ASEAN and its extended circles of ASEN+3 and the East Asian Community play a comprehensive and definitive role for East Asia at large. Domestic decision-making processes and conflicts of interests among relevant actors within states have impacts on the construction of regional frameworks in both regions. Furthermore, international organizations, especially United Nations agencies, play another active role in constructing the respective regions, often by means of building regional governance frameworks for the environment and other spheres. As another similarity in terms of framing regions, processes of establishing regional bodies naturally focus on privileging some actors, while neglecting (or, worse, silencing) others. At the same time, differences in framing these regions appear with respect to legal structures (more open-ended in East Asia) and the participation of civil society in the process (more prominent in Europe). The socially constructed nature of regions is evident everywhere (Fall and Debarbieux, this volume) while natural phenomena such as monsoon patterns or groundwater reserves can also do the constructing in certain cases (East Asian examples as presented by Taniguchi and Yasunari during the workshop).

**Crafting Cooperation**

The workshop presentations and papers presented in this volume revealed important findings on how regional cooperation in Europe and East Asia are crafted. Europe has traditionally accommodated more densely and formally structured models (see, for example case studies in Kern, this volume) while East Asian governance leans more towards informal platforms and community-building practices (Shiraiwa, this volume). At the same time, while open-ended, informal, non-institutionalized, and program/project-based cooperation models are increasingly common in East Asia, many commentators have also identified attempts to pursue East Asian cooperation through more formalized institutions. Regional environmental cooperation in East Asia is not the leading force behind recent regional frameworks but can certainly pave the way for more institutionalized and wider regionalization (Yoon, this volume). In the meantime, EU expansion has increased the feasibility of subregional environmental cooperation models such as macro-regional strategies. Multilateralism in Europe comes from this embedded tradition of dialogue while regional powers and bilateralism are still pivotal in East Asian regional dynamics. Hence, that region is more sensitive to geopolitical tensions and conflict among major players.
Reverberating beyond the Region

Both regions are not fixed and independent entities but they are rather embedded in global environmental and other structures. This reality highlights the need to further communicate the existing regional environmental frameworks (Ballaman, this volume; Nam, this volume). Active diffusion of norms and practices in both regions is more visible in recent years (e.g. through EU Neighborhood Policies) with increasing mobility and dynamism at regional and subregional levels. In terms of differences, Europe’s regionalization experiences have consolidated the formal characteristics of regions and subregions, which has strengthened regional identities, whereas the informal nature of East Asian institutionalization makes regional frameworks less visible in larger regional and global contexts. As indicated in the introduction of this volume, the mobility of regional governance mechanisms and the nature of agents of diffusion affect both regions’ ways of adaptation in this age of global change. Related with this mobility, Central Asia was discussed during the workshop and in this volume as one critical meeting point, where regional framings and cooperative strategies of European and East Asian regional environmental governance interact.

Agenda for Future Research

One of the objectives of the EE-REG workshop and this volume was to raise awareness on REG and initiate communication channels for REG researchers. The workshop was completed with a consensus among the participants that efforts to promote collaborative research on regional environmental governance should be continued. Accordingly, the workshop findings were presented at the Tokyo Conference on the Human Dimensions of Global Environmental Change (28-31 January 2013), as well as the International Studies Association Annual Convention in San Francisco (3-6 April 2013). Reports were submitted to the funders and workshop materials were circulated among the participants via internal web portal. Indeed, having its reference from the REGov (2010) experience, EE-REG website will also be used as an information sharing platform for future research collaboration. Based on this work as the workshop proceedings, the co-organizers will edit a volume on comparing European and East Asian regional environmental governance as the next crucial step of research collaboration.
WORKSHOP PROGRAM

January 24, 2013

10:00 - 11:30 Opening and Introduction (Moderator: Aysun Uyar, RIHN)
Makoto Taniguchi, RIHN (Welcome remarks)
Jörg Balsiger, University of Geneva & Aysun Uyar (Agenda setting)
Juliet Fall, University of Geneva (How regional is regional environmental governance?)
Shunji Matsuoka, Waseda University (Regional environmental governance in East Asia)
Jörg Balsiger (Regional environmental governance in Europe)

13:00 - 14:30 Rivers and Seas (Moderator: Ayako Okubo, Tokai University)
Makoto Taniguchi, RIHN
Kristine Kern, University of Potsdam
Takayuki Shiraiwa, Hokkaido University

15:00 - 16:30 Mountains (Moderator: Jörg Balsiger)
Simon Gaberell, University of Geneva
Guofan Shao, Purdue University
Gilles Rudaz, University of Geneva

January 25, 2013

10:00 - 11:30 Extreme Climate Events
(Moderator: Yoichiro Usui, Niigata University of International and Information Studies)
Tetsuzo Yasunari, Nagoya University
David Demeritt, King’s College London (did not attend)
Rolf Lidskog, Örebro University

13:00 - 14:30 Air Pollution and Haze (Moderator: Atsushi Ishii, Tohoku University)
Esook Yoon, Kwangwoon University
Richard Ballaman, Swiss Federal Office for the Environment/Convention on Long-range
Transboundary Air Pollution Executive Body
Sangmin Nam and Heejoo Lee, United Nations Economic and Social Commission for Asia and
the Pacific

15:00 - 16:20 Wrap-up (Moderator: Jörg Balsiger)
Comments
Tadashi Okimura, The University of Shimane
Mari Koyano, Hokkaido University
Makoto Taniguchi
Juliet Fall and Bernard Debarbieux (did not attend), University of Geneva

Synthesis and follow-up (Jörg Balsiger & Aysun Uyar)

16:20 - 16:30 Closing
Richard Ballaman, Swiss Federal Office for the Environment/Convention on Long-range Transboundary Air Pollution Executive Body

Richard Ballaman is since 2008 the Head of the Air Quality Management Section at the Swiss Federal Office for the Environment in the Air Pollution Control and Chemicals Division in Berne. He received his PhD in 1988 in natural sciences with a specialization in biochemistry from the University of Fribourg (CH). From 1990 until 1998, he, as scientific officer in the Basic Studies Section, acted to support and coordinate various research projects and policy-oriented activities, further as senior scientific officer in the Air Quality Management Section. He was also organizer of several workshops related to ozone, fine particulate matters and Integrated Assessment Modeling under the cooperative program for monitoring and evaluation of the long-range transmissions of air pollutants in Europe (EMEP). Between 2000 and 2012, he was chairman of the Working Group on Strategies and Review (negotiating body) and vice-chair of the Executive Body of the UNECE Convention on Long-range Transboundary Air Pollution (CLRTAP).

Jörg Balsiger, University of Geneva

Jörg Balsiger, senior researcher at the University of Geneva and previously at ETH Zurich and the European University Institute, has eighteen years of academic and practical experience in environmental politics from local to international levels. He has a PhD from the University of California at Berkeley, and a Master’s from Georgetown University. From 1995-2001, he worked in forest and environmental policy and administration, capacity building, and donor coordination for bilateral and multilateral donors, nongovernmental organizations, and developing country governments in the USA, Europe, East/Southeast Asia, and Central/Southern Africa. Since 2001, he has focused on academic and policy-oriented research, specializing in international and comparative environmental politics and policy, sustainable development, policy integration, and water governance. Most recently, he has been involved in comparative analyses of transboundary regional mountain governance initiatives. He coordinated the first global analysis of regional environmental agreements, has co-edited special issues on regional environmental governance and published several articles and working papers on the subject. Jörg Balsiger co-organized REGov workshop and is the co-organizer of EE-REG workshop.

Juliet Fall, University of Geneva

Juliet J. Fall is an Anglo-Swiss political and environmental geographer working on questions of regionalization, biosecurity, borders and national identity. She is interested in how discourses of nature are enrolled into politics, and explores how references to the environment are subverted to underpin politics, including research on how new political spaces are made, or how nature is invoked to exclude migrants. Recent research has dealt with transboundary planning, protected areas, invasive species, ideas of “natural borders”, and urban gardening. Author of Drawing the Line: Nature, Hybridity and Politics in Transboundary Spaces, Ashgate (2005); and co-editor of Aux frontières de l’Animal : mises en scènes et reflexivités, Genève/Paris (2012) with A. Dubied and D. Gerber, she is a full professor at the University of Geneva. She also works on the spaces and politics of knowledge production in a science studies perspective, and on the history of geography in Anglophone and Francophone contexts. She serves on the scientific boards of a number of journals, including Progress in Human Geography, Environment and Planning D: Society and Space, Geographical Journal, L’Espace Politique, and Geographica Helvetica.
Simon Gaberell, University of Geneva

Simon Gaberell is a PhD candidate at the University of Geneva, Department of Geography and Environment. In the frame of a Swiss National Fund project he is completing a thesis on the role of global environmental organizations in the institutionalization of regional environmental governance in the Danube-Carpathian region. To date, his research focused on the modalities of the construction of a Carpathian environmental region and on the implementation of a Carpathian Convention in the broader context of the European territorial cooperation system. In this respect he conducted a four months field research study in the UNEP Vienna Office, which is currently servicing the Interim Secretariat of the Carpathian Convention.

Atsushi Ishii, Tohoku University


Kristine Kern, University of Potsdam

Kristine Kern is professor for the “Governance of Urban Infrastructure and Global Change,” at the University of Potsdam and Leibniz Institute for Regional Development and Structural Planning (Germany) and affiliated professor in environmental sciences at Södertörn University (Sweden). After earning her PhD in political science from Freie Universität Berlin (Germany), she worked as a senior research associate at the Social Science Research Center Berlin (Germany) until 2005 and subsequently held positions at the University of Minnesota (USA), Södertörn University (Sweden), and Wageningen University (The Netherlands). Her research interests have concentrated on (environmental) governance in multi-level systems, (regional) environmental governance, sustainable cities and regions, climate and energy governance, the governance of regional seas, and EU macro-regional strategies. Her books include Governing Europe’s Marine Environment: Europeanization of Regional Seas or Regionalization of EU Policies? Ashgate (2013), with Michael Gilek and Governing a Common Sea: Environmental Policies in the Baltic Sea Region, Routledge (2008), with M. Joas and D. Jahn. Her articles have appeared in numerous leading international journals.

Heejoo Lee, World Bank

Heejoo Lee is currently working as a junior professional officer at the World Bank, in the Sustainable Development Network. Her work centers around green and inclusive cities, addressing urban environmental issues, especially in the face of climate change. Previously, she was at UNESCAP ENEA Office as a consultant working in environmental affairs. She obtained her Master of City Planning from Seoul National University and her undergraduate science degree in earth and environmental engineering from Columbia University.

Rolf Lidskog, Örebro University

Rolf Lidskog has a PhD in sociology and a PhD in ethics (both from Uppsala University). He works as professor of sociology at the multi-disciplinary Center for Urban and Regional Studies (CUREs), Örebro University. His research concerns environmental regulation, environmental sociology and risk communication. Central issues of his research concerns how actors perceive, evaluate and manage
risks, where there are high demands on safety, while science and technology often cannot guarantee it in a satisfactory manner for all. To answer this question, he has studied a variety of environmental areas: climate change, air pollution, nuclear waste, hazardous waste, biodiversity, intensive forestry and urban transport. Professor Lidskog has authored or co-authored seven books, 50 peer-reviewed articles and 30 book chapters.

**Shunji Matsuoka, Waseda University**

Shunji Matsuoka is professor at the Graduate School of Asia-Pacific Studies and Director of Institute for Global Sustainability, and General Manager of Campus Asia-EAUI Program collaborated with Korea University, Nanyang Technological University, Peking University, and Thammasat University. He is also conducting several research projects such as Fukushima Nuclear Disaster, Climate Change Policy, Integrated Solid Waste Management in Sri Lanka, and Desertification Research in Mongolia. He is the editor of *Effective Environmental Management in Developing Countries: Assessing Social Capacity Development*, Palgrave- Macmillan (2007).

**Sangmin Nam, United Nations Economic and Social Commission for Asia and the Pacific**

Sangmin Nam currently works as the deputy director at the UNESCAP East and North-East Asia (ENEA) Office located in the Republic of Korea. Prior to taking up the current assignment, he served as environmental affairs officer at the ESCAP Headquarter and ENEA Office since early 2005. Before joining the UN, he taught at Hanyang University in Seoul, served as expert member of the Presidential Commission on Sustainable Development and the Presidential Committee on Northeast Asian Cooperation Initiative of the Republic of Korea, respectively, and worked with Green Korea United, a leading environmental NGO in the ROK, as a founding member and program and policy manager. Dr. Nam obtained his PhD degree in the field of international environmental governance from University of Melbourne, Australia.

**Tadashi Okimura, The University of Shimane**

Tadashi Okimura received his doctorate in law in 2007 from Hitotsubashi University. He has served as a research fellow at the then Mitsubishi Kasei Institute of Life Science in 1999, and then became a research fellow at the Center of Life Science and Society in 2003. He became an associate professor at the University of Shimane in 2007, and a professor in 2010. His field of research is international environmental politics, international relations, and environmental policies.

**Ayako Okubo, Tokai University**

Ayako Okubo is a lecturer at the School of Marine Science and Technology, Tokai University. Between 1999 and 2001 she worked at the Embassy of Japan in Stockholm and carried out research on multilateral cooperation in the Baltic Sea region. During 2004-2007, she worked at the Ocean Policy Research Foundation and participated in meetings of the Partnerships in Environmental Management for the Seas of East Asia (PEMSEA) as a non-governmental partner. She has published on Japan’s whaling diplomacy as well as decision making process and effectiveness of international regimes for management of marine living resources.

**Gilles Rudaz, University of Geneva**

Gilles Rudaz is scientific collaborator at the Department of Geography and Environment, University of Geneva. His primary focus is on the emergence of mountains as political objects, i.e. he analyzes how societies come to identify mountains as an issue. He works on the local, national, regional and global levels. He is especially interested on how mountain communities are being considered and how they are involved in these political processes. Website: https://sites.google.com/site/rudazgilles/home.
Guofan Shao, Purdue University

Guofan Shao received his PhD from Chinese Academy of Sciences and obtained post-doc training at the University of Virginia, USA. He jointed Purdue University in 1997. His research expertise includes applying computer models and geospatial technologies in forest management, biodiversity conservation, and forest carbon quantification in China and the United States. He has been studying forest management and protection on Changbai Mountain for more than 20 years. He is an author and co-author of 129 journal articles, books and book chapters. He has served as associate editor, guest editor, and editorial board for seven academic journals.

Takayuki Shiraiwa, Hokkaido University

Takayuki Shiraiwa is associate professor at the Institute of Low Temperature Science, Hokkaido University. He received his MA in geomorphology (1987) and his PhD in glaciology (1993) from Hokkaido University. He conducted research in Antarctica (1993-1995) and at Swiss Federal Institute of Technology (2000-2001) as a visiting scientist to study paleoclimate and environment by means of ice core analyses. Then he became the leader of Amur-Okhotsk Project of the Research Institute for Humanity and Nature (Kyoto) to validate a hypothesis that dissolved iron discharged from Amur River controls primary production in the Sea of Okhotsk and the Oyashio open waters. Based on the results and activities of this difficult field, he established a multilateral science community named “Amur-Okhotsk Consortium” to further activate scientific discussions on the land-ocean linkage in the Amur Okhotsk region.

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